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RESEARCH PAPERS

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TITLE:

Designing and computational studies of Novel 5-Fluorouracil hybrids as thymidylate synthase inhibitors for targeting non small cell lung cancer

AUTHOR :

Purandare, D.; Adsule, P.; Jawarkar, R.; Nigade, A.; Satish, S.

JOURNAL NAME:

Computational Biology and Chemistry

DETAILS:

Published on 30 September 2025

ABSTRACT:

Cancer is a multifactorial disease characterized by uncontrolled cellular proliferation and impaired regulatory mechanisms, and among its diverse forms, NSCLC remains one of the most prevalent and lethal malignancies worldwide. To address NSCLC, scientists are placing great emphasis on drugs that can reduce cell resistance, improve potency or prevent DNA alterations. Recent studies on TS inhibitors have demonstrated the potential of effective management of NSCLC with minimal adverse reactions. Therefore, there is a demand for more advanced and efficient anti-cancer medications targeting TS inhibitors, as promised in the development of new anti-cancer drugs that have reduced or no adverse effects. The objectives of our recent study were to design and evaluate 5-FU-based hybrids that can inhibit TS in comparison to already known inhibitors such as Raltitrexed. We designed and performed a detailed computational study on 5-FU hybrids, intending to use them as possible inhibitors of TS. After performing various studies on 12 molecules designed, it was found that compounds C04, C08, and C12 presented better results when compared with the standard drug (Raltitrexed). Not only that, but all the designed compounds showed higher stability when compared to the standard drug. Compounds C04, C08 and C12 were chosen for additional screening for molecular studies like Free landscape energy, Principal component analysis, free binding energy study and MD Simulation. Docking investigation utilised the crystal structure of the thymidylate synthase inhibitor enzyme (PDB ID: 6ZXO). Further, MD simulations and QSAR Studies were performed, and satisfactory results were obtained, suggesting future potential drugs for the treatment of NSCLC.

Link: https://doi.org/10.1016/j.compbiolchem.2025.108697

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TITLE:

ICT-Driven Financial Literacy Programs: Empowering Citizens for Better Financial Governance

AUTHOR :

Sangjukta Halder; Renuka Deshmukh

JOURNAL NAME:

Lecture Notes in Networks and Systems

DETAILS:

Published on 1 October 2025

ABSTRACT:

This study scrutinizes the impact of ICT-driven financial literacy agendas in India, focusing on their role in promoting financial inclusion and enhancing governance. By leveraging digital tools such as mobile apps, online courses, and e-governance platforms, these programs have effectively increased financial literacy, particularly among underserved populations. The research highlights that while challenges such as the digital divide, language barriers, and varying levels of digital literacy persist, these programs significantly empower citizens to make conversant financial choices and participate more actively with public fiscal management. The incorporation of financial literateness into digital platforms also fosters greater transparency and accountability in governance. For the purpose of improving these programs, legislators, educators, and tech developers may benefit greatly from the insights this research offers. Additionally, it makes recommendations for future research topics to investigate the long-term effects of financial literacy programs powered by ICT on financial behaviors and governance in various socio-economic situations across India.

Link: https://link.springer.com/chapter/10.1007/978-981-96-7496-1_7

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Digital Transformation and the Waste Management Revolution—Application of Innovative Technologies for Smart City

AUTHOR :

Deshmukh, R.S.; Jadhav, B.R.; Pasumarti, S.S.; Mohite, M.

JOURNAL NAME:

Lecture Notes in Networks and Systems

DETAILS:

Published on 1 October 2025

ABSTRACT:

In response to the issue of growing garbage, researchers, foundations, and businesses worldwide developed concepts and created new technology that sped off the procedure. Trash comes from a variety of sources, including municipal solid trash (such as discarded food, paper, cardboard, plastics, and textiles) and industrial garbage (such as ashes, hazardous wastes, and materials used in building and demolition). Contemporary waste management methods often take sociological factors into account in addition to technological ones. This review paper's goal is to talk about the potential applications of cutting-edge digital technology in the waste disposal sector. With reference to smart cities, this study aims to comprehend the environment, including the opportunities, barriers, best practices at present, and catalysts and facilitators of Industry 4.0 technologies. An innovative approach for examining the use of digital technology in smart city transformation is put out in this study. Analysis of the suggested conceptual framework is done in light of research done in both developed and developing nations. The study offers case studies and digital technology applications in trash management. This article will examine the ways in which waste management firms are utilizing cutting-edge technology to transform waste management and contribute to the development of a healthier tomorrow.

Link: https://link.springer.com/chapter/10.1007/978-981-96-7496-1_9

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A Novel Approach to Handwritten MODI Script Character Recognition Using a Vision Transformer

AUTHOR :

Pawar, S.; Agrawal, R.

JOURNAL NAME:

Smart Innovation, Systems and Technologies

DETAILS:

Published on 1 October 2025

ABSTRACT:

Numerous historical documents have been composed using the Modi script, and their preservation and digitization are crucial for enhancing public understanding of the history recorded in Modi. However, the digitization of Modi script documents has made limited progress. In this study, we introduce a vision transformer model for recognizing handwritten Modi script characters, aiming to surpass existing methods and improve accuracy. Our approach utilizes an advanced vision transformer architecture that consumes preprocessed data through grayscale conversion, random perspective transformation, and random affine transformations. The model consists of an embedding layer, a stack of transformer encoder blocks, and a classifier head. Training involves minimizing cross-entropy loss with the Adam optimizer, using a designated portion of the dataset for training and a separate test set for evaluation. The experimental results show that our model significantly outperforms state-of-the-art methods reported in the literature for handwritten Modi numeral recognition, achieving an accuracy of 97.35%, establishing a new benchmark with exceptional precision and accuracy. This study is pioneering in successfully applying vision transformer technology to handwritten Modi script recognition.

Link: https://link.springer.com/chapter/10.1007/978-981-96-4410-0_28

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Automated Motor System for Efficient Water Management: A Step Towards Sustainable Future

AUTHOR :

Lokhande, J.; Dixit, B.

JOURNAL NAME:

IFIP Advances in Information and Communication Technology

DETAILS:

Published on 1 October 2025

ABSTRACT:

Water scarcity is a pressing global challenge threatening food security, ecosystem health, and economic prosperity. Traditional water management practices often lead to inefficient water use and contribute to environmental degradation. Automated water motor systems with integrated sensors offer a promising solution by promoting intelligent water management and minimizing waste. This survey paper comprehensively examines the state-of-the-art in this field. It explores the core functionalities, advantages, and limitations of these systems. The paper delves into various applications across agriculture, industry, and domestic environments. It analyzes advancements in sensor technology, communication protocols, data analytics, and machine learning for further optimization. The paper concludes by highlighting key research areas and future directions for developing more efficient, sustainable, and user-friendly water management solutions.

Link: https://link.springer.com/chapter/10.1007/978-3-031-98364-1_14

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Anchors as Building Blocks: A Detailed Survey of Scene Graph Decomposition and Captioning

AUTHOR :

Lokhande, J.; Verma, A.; Philip, J.J.; Haldankar, A.; Girase, S.

JOURNAL NAME:

IFIP Advances in Information and Communication Technology

DETAILS:

Published on 1 October 2025

ABSTRACT:

Image captioning is called as the task of automatically generating descriptive text for images, faces significant challenges in accurately capturing both the objects present and their intricate relationships within a scene. The graph based decomposition captures the hierarchical and compositional structure of the visual content, enabling a more detailed and organized representation of the scene. To generate captions, we employ a graph neural network that iteratively processes the scene graph, refining the representations of nodes and edges by considering their contextual interactions. This refined scene graph is then input into a language model to produce coherent and contextually accurate descriptions of the image. We assess caption diversity using metrics like Driven and Self CIDEr. Experimental results demonstrate that our method surpasses existing state-of-the-art techniques in terms of caption quality and coherence, highlighting the effectiveness of integrating anchor based and scene graph based methodologies.

Link: https://link.springer.com/chapter/10.1007/978-3-031-98356-6_4

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TITLE:

An eco-friendly solution for bioethanol production from microalgae with optimized process parameters and emission characteristics

AUTHOR :

Deshmukh, M.; Pathan, A.

JOURNAL NAME:

Renewable and Sustainable Energy Reviews

DETAILS:

Published on 26 September 2025

ABSTRACT:

The escalating demand for alternative fuels has intensified interest in bioethanol as a sustainable solution to reduce petroleum dependence, mitigate air pollution, and lower carbon dioxide emissions. This study presents a novel, eco-friendly approach for bioethanol production from Chlorella vulgaris microalgae, emphasizing the optimization of key process parameters to enhance yield and environmental performance. The methodology integrates a unique chemical pretreatment using thionyl chloride with enzymatic hydrolysis by Trichoderma viride, unlike conventional acid, alkali, or enzymatic pretreatments, and involves systematic optimization of particle size, enzyme concentration, reaction time, dilution ratio, temperature, and pH. The investigation encompasses both the extraction of ethanol from algae and the examination of emission effects on spark-ignited engines with different bioethanol–gasoline blends. The highest sugar and ethanol yields 34.5 g/L and 18.2 g/L, respectively were achieved using a particle size of BSS 200. In addition, four ethanol–gasoline blends (10–25 % ethanol by volume) were tested in a spark-ignition engine under wide-open throttle at various speeds. Compared to pure gasoline, the blends resulted in lower emissions of hydrocarbons, carbon monoxide, and carbon dioxide, although nitrogen oxide emissions increased due to elevated combustion temperatures. This work is distinguished by its integration of an unconventional pretreatment agent, species-specific process optimization, and coupled emission analysis, highlighting the potential of Chlorella vulgaris as a third-generation bioethanol feedstock with practical application in sustainable transportation.

Link: https://doi.org/10.1016/j.rser.2025.116381

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TITLE:

A scalable cloud-integrated AI platform for real-time optimization of EV charging and resilient microgrid energy management

AUTHOR :

Singh, A.R.; Rathore, R.S.; Jiang, W.; Thakare, A.; Kumar, R.S.; Khadse, C.B.; Addis, H.K.

JOURNAL NAME:

Scientific Reports

DETAILS:

Published on 28 October 2025

ABSTRACT:

The emergence of electric vehicles (EVs) as key elements in the decarbonization of transportation demands a new class of intelligent infrastructure capable of optimizing charging behavior while maintaining power system stability. This paper proposes a novel Scalable Cloud-Based Continuous Monitoring Platform (SC-CMP) designed to support real-time optimization of microgrid operations, particularly in EV-dense and renewable-integrated environments. By fusing cloud computing, machine learning (ML), and artificial intelligence (AI) with Internet of Things (IoT) data acquisition, SC-CMP enables continuous monitoring, predictive scheduling, and adaptive energy management across distributed power networks. Unlike conventional systems, SC-CMP supports both centralized and decentralized microgrid architectures, providing scalable support for dynamic load balancing, V2G coordination, and resilient energy dispatch. Simulation and validation are performed using a real-world dataset of 3395 EV charging sessions across 105 stations, demonstrating SC-CMP's superiority over existing AI/ML baselines. Quantitatively, the platform achieves 97.34% predictive accuracy, 96.81% grid stability improvement, 94.5% resource allocation efficiency, 93% scalability, and 95.2% data privacy assurance. These outcomes position SC-CMP as a comprehensive, adaptive, and cost-effective solution for microgrid-oriented EV integration, offering substantial advances in resilient power distribution, renewable energy utilization, and sustainable electric mobility. The platform serves as a foundation for next-generation microgrid control systems that demand real-time intelligence, scalability, and reliability across evolving smart grid landscapes.

.Link: https://doi.org/10.1038/s41598-025-21531-3

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Evaluating the socio-economic and environmental impacts of renewable energy deployment: A global perspective

1

AUTHOR :

Srivastava, A.; Meena, P.K.; Nayak, C.; Burande, C.G.; Wagle, C.S.; Shelare, S.

JOURNAL NAME:

Energy for Sustainable Development

DETAILS:

Published on 24 October 2025

ABSTRACT:

The rapid and widespread implementation of renewable energy (RE) systems across various sectors is vital to mitigating global warming. This study synthesizes insights from 270 peer-reviewed articles published over the past decade, examining the social, economic, and environmental impacts of RE technologies. It highlights recurring themes, challenges, opportunities, and divergences in findings shaped by regional and contextual factors. Social dimensions—particularly trust in institutions and the quality of governance—emerge as key enablers of RE adoption. The concept of place attachment also receives attention, although its role remains contested, with studies divided on whether it facilitates or obstructs RE initiatives. Economically, while the global agenda favors sustainable energy, many developed and developing countries continue to prioritize fossil fuel development for economic growth. Environmentally, much of the literature focuses on the localized negative impacts of RE projects, often underemphasizing their broader climate mitigation benefits. Additionally, there is a significant lack of research on the environmental implications of RE deployment in low-income countries. Two critical research gaps are identified: the need to further explore the benefits of co-locating RE infrastructure in developing economies and the importance of integrating First Nations perspectives and active participation in RE research and project planning.

Link: https://doi.org/10.1016/j.esd.2025.101863

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Experimental investigation and optimization of cellular light weight concrete using foam content and prediction using response surface methodology

AUTHOR :

Rajeeth, T.J.; Sharma, A.; Honnalli, R.; Sudheer Kumar, S.; Shinde, S.N.; Thenmozhi, S.

JOURNAL NAME:

Discover Sustainability

DETAILS:

Published on 24 October 2025

ABSTRACT:

This study investigates the mechanical and physical behavior of Cellular Lightweight Concrete (CLC) incorporating fly ash as a partial cement replacement, with a focus on density, water absorption, compressive strength, and split tensile strength. Experimental evaluation was conducted through both destructive and non-destructive testing (NDT) methods, supported by statistical modeling using Response Surface Methodology (RSM) to optimize mix designs. CLC was produced with varying foam contents (25%, 50%, 75%, and 100%) and foam-to-water–cement (w/c) ratios (1:25, 1:30, and 1:40), aiming to determine the optimal blend for enhanced performance. The results revealed that increasing foam content significantly reduced density and compressive strength due to increased pore volume, with 25% foam yielding the highest strength (12.68 N/mm2) and lowest water absorption (5.02%). In contrast, 100% foam content led to ultra-lightweight concrete with a density of 580 kg/m3 but experienced a drastic strength reduction to 3.65 N/mm2 and water absorption exceeding 13%, indicating high porosity. The incorporation of fly ash improved workability and sustainability while maintaining structural performance when used in balanced proportions. NDT outcomes from rebound hammer and ultrasonic pulse velocity showed a strong correlation with destructive test data, validating the integrity of the specimens. RSM provided robust predictive models with R2 values > 0.99, confirming high model accuracy. The significance of model terms was validated using ANOVA with low P-values and high F-values, while 3D Surface plots also analyzed and supported the optimization outcomes. This research confirms CLC with fly ash as a sustainable, lightweight construction material with optimized performance.

Link: https://doi.org/10.1007/s43621-025-01829-y

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Modeling the mechanical behavior of Al 7010/SiC nanocomposites using artificial neural networks

AUTHOR :

Khandare, N.H.; Shrigandhi, G.D.; Deshmukh, D.M.; Vishwanatha, S.; Shekokar, S.R.; Rajesh, K.; Dakhole, M.Y.; Krishna, K.; Prasad, C.D.; Hailu, N.

JOURNAL NAME:

Journal of Materials Science: Materials in Engineering

DETAILS:

Published on 16 october 2025

ABSTRACT:

In this study, the wear properties of three different composite formulations (T1, T2, and T3), which are highly important for aeronautical applications, are examined. The structural approach from Taguchi (L27 experimental design) is employed. To analyze the critical performance parameters, cf, such as specific wear rate (SWR) and frictional force (Ff), the Taguchi Signal-to-noise ratio approach is used. The input variables compound, applied load, rotating Speed, and sliding distance reveal significant correlations between the observed results. The optimal parameter combination of 5% composition, 15 N applied force, 160 rpm rotating Speed, and 41 M Sliding distance Showed subtle interactions that enhanced the wear resistance of the composite materials. The application of ANN-based predictions in this Study achieved an impressive accuracy of 99.72% in correlating predicted results with actual testing outcomes. This achievement facilitates the swift refinement of composite materials to meet the demanding standards of aerospace applications. This research plays a significant role in improving wear analysis and prediction methods while also fostering the development of specialized composites that offer enhanced reliability, performance, and durability for aeronautical purposes.

Link:
https://jmsg.springeropen.com/articles/10.1186/s40712-025-00342-4

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TITLE:

Gait analysis and treatment strategies for motor symptoms in Parkinson's disease: a comprehensive review

AUTHOR :

Dhatrak, P.; Lele, A.; Kshirsagar, M.

JOURNAL NAME:

Research on Biomedical Engineering

DETAILS:

Published on 14 October 2025

ABSTRACT:

In recent years, the diagnosis and monitoring of Parkinson's Disease by gait analysis has gained prominence due to its potential to associate the neurodegenerative condition with motor dysfunctions. By evaluating the gait parameters, researchers can track the progression of the condition and establish personalized treatment and intervention options depending on the severity of the disease. This comprehensive review seeks to investigate the growth of human movement analysis using wearable and non-wearable sensor technologies to associate gait impairments with Parkinson's Disease. The article is categorized into sections to discuss the various gait impairments associated with Parkinson's disease. Several wearable and non-wearable sensor techniques are employed to study the motor symptoms in detail, as well as develop numerous intervention methods to halt the progression of the disease. Various wearable and non-wearable sensor devices are employed to analyze and understand the gait patterns of patients to diagnose and monitor Parkinson's disease.

Link: https://doi.org/10.1007/s42600-025-00438-y

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TITLE:

Analysis of compressor performance using data-driven machine learning techniques

AUTHOR :

Hujare, P.; Sanap, Y.; Ingle, P.; Hujare, D.; Chavan, U.; Atre, V.

JOURNAL NAME:

Journal of Engineering and Applied Science

DETAILS:

Published on 26 September 2025

ABSTRACT:

The verification of mathematical models for multistage reciprocating compressors is crucial for ensuring their accuracy and reliability. In this study, we used different machine learning (ML) models to verify the results of MATLAB-based models of single-stage reciprocating compressors, multistage reciprocating compressors without intercoolers, and multistage reciprocating compressors with intercoolers to simulate the real-world operating conditions of a reciprocating compressor. The verification focuses on key performance indicators, such as the pressure–volume (PV) graph, outlet temperature graph, volumetric efficiency, and pressure ratio graph. The MATLAB model computes thermodynamic parameters, such as the power required, outlet pressure, and outlet temperature for various operating conditions. The MATLAB model produced the following results for single-stage compressor: the outlet pressure increased by 1.6 times the inlet pressure of the compressor, the volume reduced by 20% of the volume at the inlet of the single-stage compressor, and the outlet temperature increased by 30% of the inlet temperature. In the case of a multistage compressor without an intercooler, the outlet pressure increased by about 3.3–3.6 times the inlet pressure of the compressor; the volume reduced by 60% of the volume at the inlet, and the outlet temperature increased by 35% in comparison to the inlet temperature of the multistage compressor without an intercooler. Subsequently, in the case of a multistage compressor with an intercooler at the first stage of compression, the pressure increased by three times the inlet pressure; at the second stage of compression, the pressure increased by six times the inlet pressure of the compressor, the volume was reduced by approximately 80%, and the intercooler maintained the increase in outlet temperature by 30%, limiting it and preventing excessive expansion of air in the compressor and increasing the efficiency of the compressor by 12% in comparison to the multistage compressor without an intercooler. In addition, the results generated by all the machine learning models used in the study were in correlation with the results generated by the MATLAB model for all three compressors, with an accuracy of approximately 90% or more for almost all the models implemented for prediction. By comparing the predicted outputs from the ML model with the MATLAB-generated results, the accuracy and consistency of the simulation were assessed. This study aims to bridge the gap between traditional mathematical modeling and modern data-driven validation techniques to ensure robustness in compressor performance predictions.

Link: https://doi.org/10.1186/s44147-025-00752-3

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Unlocking the potential of nanocellulose in biomedical innovations: A sustainable marvel

AUTHOR :

Chavali, M.; Singh, M.; Srivastava, A.; Enamala, M.K.; Kuppam, C.; Anna Nastro, R.A.; Kapoor, S.; Mishra, R.

JOURNAL NAME:

Science of the Total Environment

DETAILS:

Published on 24 October 2025

ABSTRACT:

With rapid urbanization and growing apprehensions due to environmental and ecological issues, the synthesis of novel functional and innovative materials is on the rise. If developed from natural resources, such complex chemicals and novel materials will be better for the environment. Such chemical products of great public value will encourage green synthesis. Cellulose and nanocellulose (NC) gained extensive consideration as a nano-reinforcement for polymer matrices, finding applications in countless businesses. Because of its intrinsic sustainability characteristics and abundant availability, NC stands out as a highly significant and promising ecological material in today's world. This review explores NC properties (such as Modification of hydroxyl groups, Covalent modification, and Functionalization with ionic groups), drawing on research where SEM, AFM, and XRD techniques analyze its morphology, surface properties, and crystallinity, significant variations, and a scientometric study. This review also summarizes recent advances and emerging uses of NC and its nanocomposites in biological and medical applications like wound dressing, tissue engineering and repair, stem cell therapy, smart drug delivery, biosensing, and new biomedical applications. NC has outstanding mechanical strength, Young's modulus, and biocompatibility, and is used to synthesize an extensive variety of nanomaterials, comprising metal, metal oxide, polymer, and carbon nanostructures and nanocomposites. It is also used in food packaging, reinforced polymer composites with high mechanical strength, tissue scaffolds, drug delivery, biosensors, filtration, biophotonics, and 3D bioprinting. The versatility of NC and its contribution to sustainable innovation establish it as a crucial material for environmental and medical advancements.

Link: https://doi.org/10.1016/j.scitotenv.2025.180778

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Enhancing Energy Efficiency in Sustainable Infrastructure with AI-Enabled IoT Systems

AUTHOR :

Malwade, S.; Deokate, S.T.; Rajput, S.D.; Patil, M.S.; Gulhane, M.; Rakesh, N.

JOURNAL NAME:

Smart IoT for Sustainable Development (Book Chapter)

DETAILS:

Published on August 2025

ABSTRACT:

By increasing energy efficiency, combining artificial intelligence (AI) and the Internet of Things (IoT) technologies might entirely transform the operation of sustainable infrastructure. The development and use of AI-powered IoT systems aimed to maximize energy in many infrastructure environments including transportation, urban planning, and buildings are discussed in this study. By gathering data in real time and using sophisticated analytics, these systems assist in energy regulation that varies with the hours and user behavior. Our primary emphasis is on artificial intelligence projects that can predict consumer energy needs and then modify supply to fit those requirements, hence reducing waste and expenses. Case studies of smart buildings illustrate how IoT devices and artificial intelligence prediction models may significantly lower energy usage by making heating, ventilation, and air conditioning (HVAC) systems run better based on expected weather and population. In the same manner, by utilizing real-time data to improve route planning and traffic signs, AI-enhanced traffic management systems in the transportation sector cut fuel usage and pollution. This study also covers the issues associated with deploying these technologies, including data protection, ensuring that many systems can cooperate and the need for robust security measures to safeguard personal data. It discusses how to handle these issues with an emphasis on the need for public and private sectors to cooperate and implement well-defined policies.

Link: https://doi.org/10.1201/9781003539629-14?urlappend=%3Futm_source%3Dresearchgate

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

IoT-Based Environmental Monitoring: Tracking Climate Change and Promoting Sustainable Development

AUTHOR :

Bhosale, P.; Kalgaonkar, S.; Jain, D.; Bhagwat, A.

JOURNAL NAME:

Smart IoT for Sustainable Development (Book Chapter)

DETAILS:

Published on August 2025

ABSTRACT:

As a game-changer in environmental monitoring, the Internet of Things (IoT) has great promise for tracking climate change and promoting sustainable development. The implementation of IoT-based devices to gather data in real time on vital environmental parameters like temperature, humidity, air quality, and soil moisture is examined in this study. Continuous monitoring is made possible by these networked sensors, which also allow for early environmental change detection and offer insightful information to stakeholders, researchers, and policymakers. Our ability to comprehend climatic patterns, recognize trends, and project future scenarios will improve with the integration of IoT with sophisticated data analytics and machine learning algorithms, enabling us to make better decisionsThere are difficulties in integrating IoT with environmental monitoring. In order to guarantee the dependability and efficiency of these systems, concerns like data privacy, security, and the requirement for standardization in IoT protocols must be addressed. Furthermore, in order to ensure long-term operation, the deployment of IoT devices in harsh or isolated environments calls for strong and long-lasting hardware solutions in addition to effective energy management. To build a safe and interoperable IoT ecosystem that can support extensive environmental monitoring projects, legislators, industry leaders, and technology developers must work together to overcome these obstacles. Furthermore, by encouraging effective resource management, lowering waste, and optimizing energy use, IoT-driven solutions support sustainable growth. For example, smart grids can balance energy loads to avoid waste, while smart irrigation systems can accurately control how much water is used in agriculture. By facilitating adaptive responses to environmental changes, this study highlights the significance of IoT in reducing the effects of climate change. It also highlights how governments, businesses, and academic institutions must work together to develop and deploy cutting-edge IoT technologies that advance sustainability objectives. In the end, the incorporation of IoT into environmental monitoring underscores the transformative potential of technology in tackling global environmental concerns and is a critical step toward realizing a more resilient and sustainable future.

Link: https://doi.org/10.1201/9781003539629-3

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Aerial Farming: The Role of Drones in Modern Agriculture

AUTHOR :

Gavas, S.; Kosamkar, P.

JOURNAL NAME:

Smart IoT for Sustainable Development (Book Chapter)

DETAILS:

Published on August 2025

ABSTRACT:

Drones have become a revolutionizing asset in the agricultural domain by providing new methods of increasing efficiency and sustainability. About existing research, this chapter focuses on the major drone uses in agriculture, such as crop scouting, pest control, water management, soil properties assessment, seeds and fertilizers application, and animal husbandry. Using drones fitted with sensors and high-definition cameras, farmers such as Buber farmers can monitor crop conditions, diagnose, and cure diseases in their infancy, as well as save on the use of water and fertilizers, thus increasing output and reducing costs. Controlled use of thermal power and targeted spraying technology in pest control reduces the chemicals used and the negative effects on the environment. Assistance on irrigation in drones with multispectral cameras reduces excessive water movement by providing information about the moisture of the soil. Drones have also proven to be quite useful in the domain of soil assessment, allowing for data collection that fosters better management of soil. Seed placement accuracy and effectiveness increase when the procedure is done through drones, thus reducing labor costs. In addition, drones have become beneficial in livestock health monitoring, enabling early warning of possible health problems as well as enhancing livestock management practices. Weed detection, assisting the distribution of pollinators, and aid during harvesting are just a few of the applications that illustrate how drones can emphasize reducing the physical undertaking as well as improving the accuracy of the operations carried out. There are however obstacles, which to some extent include government policies, operational costs, technology challenges, and more importantly, the complicatedness of data handling and analysis. To use drones to promote sustainable and effective farming practices, all of these issues need to be fixed.

Link: https://www.taylorfrancis.com/chapters/oa-edit/10.1201/9781003539629-9/

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Characterization of GTAW welded steel (572 GR 50)

AUTHOR :

Kumar, H.; Prasad, R.; Kumar, P.; Deo, M.

JOURNAL NAME:

AIP Conference Proceedings (Vol.- 3342, Issue- 1)

DETAILS:

Published on 30 September 2025

ABSTRACT:

Gas tungsten arc welding (GTAW) is extensively used in industry and other various field due to its versatility and adaptability. The process conditions that are the parameters used during welding heavily affect the heat input in the weld zone and hence heat affected zone and mechanical properties. The process conditions followed in the present study is totally based on the rigorous literature survey and authors experience. The parameters adapted for the current investigation were current of 170 amps, gas flow rate of 14 litres per minute and welding speed of 1.25 mm/sec. The different weld zones in the welded structure were characterized via optical microscopy. The performance of the structure was evaluated by hardness and tensile strength. The results obtained revealed coarse grain structure in heat affected area and higher hardness in welded zone in comparison to base and HAZ. The strength was found to be less comparatively in welded area due to coarser grain structure.

Link: https://doi.org/10.1063/5.0296804

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Enhancement of strength and ductility of aluminum-silicon alloy by FSP

AUTHOR :

Kumar, H.; Prasad, R.; Kumar, P.

JOURNAL NAME:

AIP Conference Proceedings (Vol.- 3342, Issue- 1)

DETAILS:

Published on 30 September 2025

ABSTRACT:

An environmentally acceptable method for microstructural modification called friction stir processing (FSP) is a viable tool to solve the problems with cast products. Although FSP has been used with Al-Si alloys, no studies have been done on its use to hypereutectic alloys. The processing of hypereutectic Al-Si using FSP is the main emphasis of this work. The tool rotates quickly during FSP, which causes a high stirring rate that disintegrates α-Al dendrites. Along with uniformly dispersing silicon particles throughout the stirring zone, the method also refines the acicular Si particles within the matrix. The treated alloy exhibits significantly higher strength and hardness due to the fragmentation of α-Al dendrites and even dispersion of Si particles within the matrix.

Link: https://doi.org/10.1063/5.0296803

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Characterization of copper based composite reinforced with SiC via FSP

AUTHOR :

Kumar, H.; Prasad, R.; Kumar, P.

JOURNAL NAME:

AIP Conference Proceedings (Vol.- 3342, Issue- 1)

DETAILS:

Published on 30 September 2025

ABSTRACT:

This study investigates the use of friction stir processing (FSP) to generate composites by incorporating silicon carbide ceramics into copper matrix. The composites' microstructure was examined using optical and scanning electron microscopy. Significant grain refinement was seen in the FSP-treated composites, which was probably caused by dynamic recrystallisation. Good connection between the particles and the copper matrix is indicated by the homogeneous dispersion of particles in the treated zone. The solid-state nature of FSP and the processing conditions may have contributed to the homogeneous distribution of the particles. The composite's strength and hardness were increased by the addition of silicon carbide particles. Grain refinement, variations in thermal expansion coefficients, the Orowan mechanism, and the shear lag effect are probably the combination of strengthening mechanisms responsible for this improvement.

Link: https://doi.org/10.1063/5.0296802

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Integration of Blockchain and Fintech in Revolutionizing The Indian Banking Sector: A Data-Driven Study

AUTHOR :

Shah, A.H.; Chawla, N.; Bhinge, M.; Bhope, A.; Deshmukh, P.B.; Deokar, A.; Bhojne, A.A.

JOURNAL NAME:

International Journal of Accounting and Economics Studies (Vol.-12, Issue-6)

DETAILS:

Published on 3 October 2025

ABSTRACT:

The integration of FinTech solutions with Blockchain technology has transformed the Indian banking sector, improving operational efficiency, security, and customer experience. This study examines the perspectives, cognizance, and preparedness of stakeholders with respect to the integration of blockchain and fintech into banking services. A structured survey using a questionnaire was conducted with 230 participants, including customers, professionals, and banking employees. The analysis assessed the effects of technological integration on transparency, cost-efficiency, transaction speed, and trustworthiness in banking services. The findings demonstrate a significant positive disposition towards the integration of Blockchain and FinTech, with primary obstacles recognized as insufficient awareness, inadequate infrastructure, and unclear regulations. The research provides valuable insights for policymakers, financial institutions, and FinTech startups to jointly promote the transformation of digital banking in India.

Link: https://doi.org/10.14419/e0nczj28

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Fatigue Behavior of Functionally Graded Honeycomb Sandwich Composites

AUTHOR :

Behera, A.; Patel, V.; Thomas, T.; Makireddi, D.; Dehury, J.; Mohapatra, S.R.

JOURNAL NAME:

In book: Novel Applications of Functionally Graded Materials

DETAILS:

Published on July 2025

ABSTRACT:

This chapter introduces functionally graded (FG) honeycomb sandwich composite (HSC) structures, highlighting their composition, manufacturing processes, and distinctive characteristics. Predominantly, the chapter aims to provide a comprehensive overview of the fatigue behavior of FG-HSC structures, which play a pivotal role in aerospace, automotive, and marine applications due to their lightweight and high-strength properties. Beginning with an introduction to FG-HSC and the importance of fatigue characterization in composite materials, the chapter delves into the fundamentals of fatigue, its mechanisms, and factors influencing fatigue behavior in composite materials. The chapter discusses experimental fatigue characterization techniques, testing standards, specimen preparation methods, and data analysis techniques specific to FG-HSC. Moreover, it explores the intricacies of fatigue testing procedures, emphasizing load application methods and considerations for testing these complex FG structures. Fatigue behavior in HSC is examined in detail, presenting experimental results and highlighting the influence of core material, skin material, and bonding techniques on fatigue performance. The chapter also discusses environmental factors affecting fatigue behavior, providing insights into real-world durability. The current industrial applications, emerging trends in fatigue testing and analysis techniques, and future research and development directions in fatigue characterization are also explored. This chapter is a valuable resource for researchers, engineers, and practitioners involved in designing, testing, and optimizing HSC structures for enhanced durability and performance in demanding applications exposed to dynamic loading.

Link: https://doi.org/10.1201/9781003656333-4

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Mechanical Properties and Behaviour of Functionally Graded Materials

AUTHOR :

Patel, V.; Behera, A.; Solanki, M.; Thomas, T.; Azim, S.

JOURNAL NAME:

Novel Applications of Functionally Graded Materials (Book Chapter)

DETAILS:

Published on July 2025

ABSTRACT:

This chapter defines the mechanical aspects of Functionally Graded Materials (FGMs) that help to decide the applications in which they are well-suited. FGMs are specially designed materials that have been given precise compositions and microstructures to fulfill demands for performance in a range of applications. The study covers four major fabrication routes: Powder Metallurgy (PM), Additive Manufacturing (AM), Centrifugal Casting (CC), and Electrophoretic Deposition (EPD). The mechanical behaviour of FGMs is influenced by the distinct benefits and difficulties associated with each fabrication technique. The composition gradients of FGMs have a significant impact on their mechanical characteristics, including strength, hardness, thermal conductivity, and resistance to corrosion. Customizing these gradients allows FGMs to reduce fatigue failure, stress concentrations, and temperature gradients, which qualifies them for high-performance uses in the energy, aerospace, automotive, and biomedical industries. Several published papers have defined and discussed specific FGMs, thus this chapter sheds light on the key properties that need to be focused on when developing FGMs. The intended objective of the current work is to provide insight into the mechanical properties of FGMs in terms of applications and material selection.

Link: https://doi.org/10.1201/9781003656333-3

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Integral equation methods in acoustic wave propogation for structural health monitoring

AUTHOR :

Pangave, V.V.; Singh, S.; Redkar, S.; Sawadatkar, S.; Raikwar, R.; Radhakrishnan, S.

JOURNAL NAME:

Journal of Interdisciplinary Mathematics (Vol.-28, Issue-6)

DETAILS:

Published on 30 September 2025

ABSTRACT:

Integral equation methods are a useful way to look at how sound waves move in structural health monitoring (SHM). These methods naturally work with endless areas, complex borders, and different types of media because they change the form of governing differential equations into integral forms. One important numerical method is the boundary element method (BEM), which lowers the number of dimensions in a problem and speeds up computations. This study looks at different ways to use integral equations, how to use them numerically, and how they can be used to correctly model sound events for finding structure problems in health tracking applications.

Link: https://doi.org/10.47974/JIM-2357

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Crestless Contracted V-Notch Weir For Flow Measurement In Triangular Open Channels

AUTHOR :

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

JOURNAL NAME:

Larhyss Journal (Vol.-2025 Sept., Issue-63)

DETAILS:

Published on September 2025

ABSTRACT:

The authors introduce a crestless contracted V-notch tailored to triangular channels, delivering a rigorously derived discharge coefficient while removing upstream-depth dependence. The discharge coefficient collapses to a single dimensionless driver—the section-reduction ratio $\zeta = m2/m1 = b/T$, which makes design, calibration, and use straightforward. A wide experimental campaign spanning nine notch geometries and 2,879 runs validates the theory with a maximum deviation of just 0.015%. Operating without a crest, the device is self-cleaning, inexpensive to build in situ, and easily adapted to existing channels. Choosing ζ in the 0.35–0.50 range ensures a stable control section, avoids surface-tension bias, and preserves high-precision metering across practical flow rates. The approach remains subcritical upstream and passes through a critical control section at the notch, yielding a single-valued, field-robust stage–discharge relation. The result is a compact, high-accuracy alternative to costly electronic meters, ideal for irrigation canals, distribution networks, and on-site monitoring programs.

Link:
http://larhyss.net/ojs/index.php/larhyss/article/view/16760

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Mathematical modeling of drug delivery systems with diffusion and absorption equations

AUTHOR :

Gupta, V.; Bhardwaj, U.; Sood, Y.; Bhanuse, V.; Musale, V.; Kumar, M.R.

JOURNAL NAME:

Journal of Interdisciplinary Mathematics (Vol.-28, Issue-6)

DETAILS:

Published on 30 September 2025

ABSTRACT:

Mathematical modelling plays a fundamental role in designing drug delivery systems, where the goal is to release an active molecule at a controlled rate and in a specific target region. Diffusion and absorption processes govern how drugs migrate through polymers and tissues and how they are taken up by the body. Challenges arise from spatially varying material properties, nonlinear boundary conditions and the coupling between diffusion within the device and absorption by biological tissues. This paper formulates a one dimensional diffusion–absorption model for a controlled-release reservoir coupled to a sink that mimics systemic uptake. Starting from Fick's laws, we derive the governing partial differential equation with a first order absorption term and solve it using separation of variables and Laplace transforms. The model predicts concentration profiles inside the device and the fraction of drug released as functions of time. Results show that higher diffusion coefficients accelerate release, whereas stronger absorption reduces internal concentrations but increases the rate of systemic delivery. The proposed framework provides insights into the interplay between device parameters and pharmacokinetic outcomes and offers guidelines for optimizing controlled release formulations.

Link: https://doi.org/10.47974/JIM-2369

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Algorithmic approaches to real and complex geometry in computer vision applications

AUTHOR :

Shaikh, F.; Pervez, M.S.; Banait, S.S.; Goswami, S.; Kumar, A.; Patkar, U.C.

JOURNAL NAME:

Journal of Interdisciplinary Mathematics (Vol.-28, Issue-6)

DETAILS:

Published on 30 September 2025

ABSTRACT:

The article "Algorithmic Approaches to Genuine and Complex Geometry in Computer Vision Applications" talks almost how geometric thoughts can be utilized to create computer vision frameworks work superior and be more exact. The objective of the ponder is to fathom issues in picture acknowledgment, protest spotting, and 3D modeling by utilizing both genuine and complicated geometric strategies. The think about comes up with modern strategies that utilize logarithmic geometry, differential geometry, and complex investigation together to create superior utilize of visual information. These strategies help us to navigate visual challenges like blocked views or changing light by providing strong scientific models. These geometric methods make computers speedier and more accurate in many respects, according to testing. They appear to be advancing computer vision. This cross-disciplinary work bridges theoretical geometry and real-world eyesight. Engineers and analysts have everything they need to create stronger, more effective visual frameworks.

Link: https://doi.org/10.47974/JIM-2377

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Computational harmonic analysis for image compression

AUTHOR :

Molawade, M.H.; Desai, S.; Kadam, U.; Kumar, S.V.; Vanjire, S.; Kakad, S.

JOURNAL NAME:

Journal of Interdisciplinary Mathematics (Vol.-28, Issue-6)

DETAILS:

Published on 30 September 2025

ABSTRACT:

Digital images consist of two-dimensional arrays of pixel values, and storing such arrays without compression quickly becomes prohibitive. Harmonic analysis offers a mathematical framework for representing images by superpositions of basic functions that capture global and local features. This paper explores the use of computational harmonic analysis in image compression. Classical Fourier representations capture global frequency content but lack spatial localization, while wavelet and related multiresolution approaches provide time–frequency localization that is ideal for images. The challenges addressed include balancing compression ratio and perceptual quality, dealing with high-dimensional data and edge artefacts, and designing computationally efficient transforms. The methodology combines Fourier, discrete cosine and wavelet transforms, energy compaction measures and coefficient quantization to produce compact codes. A combination of transform coding and entropy coding is used to exploit sparsity in the transformed domain. Results on standard test images show that wavelet-based compression achieves higher compression ratios and peak signal-to-noise ratios than traditional Fourier methods. The outcomes highlight that harmonic analysis tools enable compact representation of image information and open avenues for further hybrid and adaptive schemes.

Link: https://doi.org/10.47974/JIM-2365

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Monte Carlo and quasi-Monte Carlo methods for high-dimensional integration

AUTHOR :

Joshi, M.; Gurav, P.; Wani, T.A.; Korwar, G.; Barapatre, H.; Veni, C.K.

JOURNAL NAME:

Journal of Interdisciplinary Mathematics (Vol.-28, Issue-6)

DETAILS:

Published on 30 September 2025

ABSTRACT:

Monte Carlo (MC) and Quasi-Monte Carlo (QMC) methods have become important ways to solve complex integration problems in engineering, banking, and science computing. MC uses random sampling to get better convergence, but QMC uses organized low-discrepancy patterns to do the same thing. This work looks at the theoretical bases, error limits, and real-world uses of both methods, with a focus on variance reduction, importance sampling, and mixed randomized QMC strategies. This paper discuss about these methods side by side shows how they combine processing complexity, accuracy, and stability, which is why they are so important in current applied mathematics and computational science.

Link: https://doi.org/10.47974/JIM-2364

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Optimizing Myocardial Infarction Prediction Performance Using Advanced Machine Learning Techniques

AUTHOR :

Jamage, S.K.; Mali, R.Y.; Shete, V.V.

JOURNAL NAME:

International Journal of Electrical and Electronic Engineering and Telecommunications (Vol.-14, Issue-5)

DETAILS:

Published on 5 September 2025

ABSTRACT:

The rising prevalence of Myocardial Infarction (MI) and limited clinical resources highlight the need for accurate, automated diagnostic tools. This study presents a Machine Learning (ML) framework for early MI prediction using both structured health records and Electrocardiogram (ECG) data. Multiple ML algorithms—including ridge classifier, radius neighbor classifier, linear SVC, and extra trees classifier—are evaluated on two publicly available datasets and two clinical datasets collected from hospitals. The additional trees classifier achieves the highest training accuracy of 1.00, with consistent performance across datasets. For ECG-based diagnosis, a deep learning model combining Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN) is developed using the ECG Heartbeat Categorization Dataset. It classifies five heartbeat types: normal, Fusion of Paced and Normal (FPAN), Fusion of Ventricular and Normal (FVAN), Atrial Premature Contractions (APC), and Premature Ventricular Contractions (PVC). The model achieves a testing accuracy of 0.98, supported by strong precision and recall across classes. The novelty of this study lies in its integration of public and real-world datasets, noise-augmented training to improve ECG robustness, and a multi-class CNN–RNN framework that enhances generalizability beyond conventional binary classifiers. The proposed approach contributes to more reliable and interpretable cardiovascular diagnostics, with strong potential for clinical deployment and improved patient outcomes.

Link: https://www.ijeetc.com/show-251-1904-1.html

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Factors affecting and methods of reducing thermal stratification in cryogenic storage tanks of launch vehicles: review article

AUTHOR :

Raibole, K.V.; Sonawwanay, P.D.

JOURNAL NAME:

Journal of Thermal Engineering (Vol.-11, Issue-5)

DETAILS:

Published on September 2025

ABSTRACT:

Contemporary launch vehicles of the past few decades primarily implement liquid rocket engines, which in turn employ cryogenic propellants stored in sub-zero conditions in highly sophisticated cryogenic storage tanks. These tanks are usually deprived of any thermal insulation in order to prioritize the payload capacity, and thus they are prone to a substantial amount of heat influx that leads to a rise in the temperature of the cryogenic liquid, leading to thermal stratification. This paper presents a comprehensive review of the various factors affecting the rate of thermal stratification in cryogenic propellant storage tanks, along with numerous experimental and numerical techniques developed for controlling or mitigating this stratification through geometrical modifications, varying surface properties, and bubbling of gases through the bulk liquid. Out of the techniques reviewed, simple geometrical modifications showed substantial results, with ribs reducing stratification by up to 30%. On the other hand, complex techniques like bubbling of gases destratified the bulk liquid within 25 to 35 s. A special focus has also been placed on reviewing the numerical modelling and simulations of this phenomenon, particularly those developed in recent years.

Link: https://dx.doi.org/10.14744/thermal.0000994

Since 1983

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Exploration of DNA binding mode of Coumarin Glycoside Esculin by Multispectral and Molecular dynamics approaches

AUTHOR :

Inamdar, P.R.; Chaudhari, V.P.; Bhandari, S.V.; Chaudhari, S.; Polshettiwar, P.

JOURNAL NAME:

Indian Journal of Biochemistry and Biophysics (Vol.-62, Issue-9)

DETAILS:

Published on 18 August 2025

ABSTRACT:

Due to the unwanted and undesired effects of existing anticancer agents, medicinal chemists are exploring drugs from natural origin. Phytochemicals and their derivatives can be developed as Biologically diverse agents with fewer side effects. Therefore, exploration of the different biological activities of natural products had been a keen interest in repurposing of the drugs. Present study focuses on the analysis of DNA (Deoxyribonucleic Acid) interactions of esculin using spectroscopic and molecular docking, simulation techniques, and MMGBSA (Molecular Mechanics Generalizing Born Surface Area) calculations. We used different spectral techniques to investigate the interactions of esculin with DNA. FTIR (Fourier Transform Infra Red Spectroscopy) spectral studies suggested the primary formation of non-covalent bond between esculin and the nitrogen base of DNA, stating the primary analysis of interactions. The observation revealed that the UV-visible (UltraViolet) spectra of esculin exhibited perturbations in the presence of CT (Calf thymus) DNA and interacted with DNA in the groove binding mode. The hyperchromic effect was determined by the increase in the absorbance value of esculin in the presence of DNA, and the binding constant (Kb) value of esculin was $2.327 \pm 0.09 \times 103$ M-1. By conducting circular dichroism and viscometric analysis of DNA in the presence of esculin, we could support the groove binding mode of esculin. In Silico studies suggested that esculin has bound in the major groove between the base pairs with 6 Hydrogen bond interactions with different nucleobases. Molecular simulation analysis supported the results with lowest RMSD (Root mean square deviation), stating the stable complex of PDB (Protein Data Base) and esculin. MMGBSA analysis suggested that significant contributions from van der Waals interactions made the overall binding favorable. These findings can lead to design of DNA interacting esculin based derivatives exhibiting the anticancer potential.

Link: https://doi.org/10.56042/ijbb.v62i9.16613

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Deposition and Characterization of Mixed Titanium Oxide-Iron Oxide Electrodes

AUTHOR :

Pardhi, N.B.; Wagh, S.S.; Patole, S.P.; Shah, K.A.; Jadkar, S.R.; Pathan, H.M.

JOURNAL NAME:

ES Energy and Environment (Vol.-29)

DETAILS:

Published on 10 September 2025

ABSTRACT:

We report the synthesis of TiO2 and Fe2O3 electrodes using the co-precipitation method. Fe2O3 was incorporated with mesoporous TiO2 over compact TiO2 thin films. The films were deposited onto FTO substrates via spin coating approach. We have investigated the effect of variation of spin coating sets. The x-ray diffraction studies show that the micro-strain and dislocation density increases with increase in spin coating cycles. From optical studies using ultraviolet-visible absorption spectroscopy and time-resolved photoluminescence spectroscopy, it is observed that absorbance shifts towards longer wavelengths with increase in charge carrier lifetime. UV-Visible spectroscopy reveals that Urbach energy increases with change in number of deposition cycles. Also results indicate that surge in the spin coating sets leads to a decrease in pore size. Morphological and elemental analysis from scanning electron microscopy revealed a rise in orderly arrangement in TiO2-Fe2O3 than bare TiO2. The electrode when used as a photoanode, has shown an increase in short circuit current density and open-circuit voltage of the device with increment in deposition cycles, with short-circuit current density (Jsc) of 6×10^{-5} A, an open-circuit voltage (Voc) of 0.17 V.

Link: http://dx.doi.org/10.30919/ee1701

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Two new species of Protosticta Selys, 1885 (Odonata: Zygoptera: Platystictidae) from the Western Ghats, India

AUTHOR :

Chandran, A.V.; Sawant, D.; Chandran, R.; Koparde, P.; Ogale, H.; A.A.; Kunte, K.

JOURNAL NAME:

Zootaxa (vol.-5679, Issue-4)

DETAILS:

Published on 8 November 15 August 2025

ABSTRACT:

We erect two new species of damselflies from the Western Ghats Biodiversity Hotspot, Protosticta sanguinithorax sp. nov. from Kerala and P. shambhaveei sp. nov. from Maharashtra, India. Morphologically, these species show close affinity with P. sanguinostigma Fraser, 1922, an endemic species of the Western Ghats; however, they are distinguished by their ground colouration, unique features in their prothoraxes, caudal appendages, and accessory genitalia. We also establish a significant genetic distance, based on the COI gene, between these newly erected Protosticta species and P. sanguinostigma. We present an updated taxonomic key to the males of Protosticta species in the Western Ghats, incorporating newly available diagnostic information.

Link: https://doi.org/10.11646/zootaxa.5679.4.1

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Luxury and Smart Products

AUTHOR :

Kaur, T.

JOURNAL NAME:

Technology-Driven Market Transformations for Digital Fashion and Smart Luxury (Book Chapter)

DETAILS:

Published on August 2025

ABSTRACT:

Co-branding in smart luxury products merges the innovation of tech firms with the exclusivity of luxury brands to create premium hybrid offerings. Examples include TAG Heuer Connected and Apple Watch Hermès. These collaborations attract tech-savvy consumers and elevate brand value through emotional appeal and functionality. While offering strategic advantages like market expansion and storytelling, challenges include aligning brand identities, pricing strategies, and service expectations. Success depends on authenticity, shared values, and delivering a seamless, emotionally resonant consumer experience in a fast-evolving digital-luxury landscape.

Link: https://www.igi-global.com/chapter/luxury-and-smart-products/386970

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Development and Implementation of a Smart Single-Station Manual Assembly Cell for an Inexperienced Worker to Enhance Industrial Efficiency in an MSME

AUTHOR :

Shinde, P.S.; Patil, S.S.; Poredi, C.S.; Shelke, G.S.; Subhedar, J.J.; Dhanvijay, M.R.; Patil, S.M.

JOURNAL NAME:

Science Essence Journal (Vol.-41, No.-2)

DETAILS:

Published on October 2025

ABSTRACT:

Micro, Small, and Medium Enterprises (MSMEs) often face low efficiency, high error rates, and operator fatigue in manual assembly. High turnover of inexperienced/novice workers worsens these issues. Automation is common in large industries, but affordable smart solutions for MSMEs are limited. This study addresses the gap by converting a Traditional Single-Station Manual Assembly Cell (SSMAC) into a Smart SSMAC i.e. Smart Assembly Table (SAT). The SAT/Smart SSMAC uses smart technologies to improve efficiency, reduce errors, and counter the effects of high attrition among novice workers. A design-based experimental method was used. The upgrade included a Programmable Logic Controller (PLC), a Human-Machine Interface (HMI), sensor-enabled bin racks, and a modular workstation layout. The SAT/Smart SSMAC was tested in an MSME with inexperienced/novice workers. Productivity, error rates, and labor cost efficiency were measured. Real-time monitoring and digital displays guided operators in part selection, placement, and cycle time adherence using video and alarms. Tests with five inexperienced/novice workers over 100 assembly cycles showed significant gains. Cycle time dropped by 22.5%, and operator errors fell by 71.43%. Meeting the target cycle time improved by 34.33%, and delays reduced by 69.69%. The upgrade cost INR 129,988. Labor cost per unit decreased by INR 11.38, giving a 35% reduction. The SAT/Smart SSMAC supports Industry 4.0 goals, enhances lean manufacturing, and retains human involvement. Future upgrades, such as predictive maintenance and augmented reality, could further increase its benefits. The system's flexibility across skill levels and product complexities offers potential for broader application.

Link:
https://ejournals.swu.ac.th/index.php/sej/article/view/16996

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

A Novel Method for Viral Conjunctivitis Detection using CNN-Based Image Analysis

AUTHOR :

Gandal, J.; Ayadi, W.; Farhat, Y.; Metkewar, P.S.; Bhat, S.A.; Rather, A.A.

JOURNAL NAME:

International Journal of Statistics in Medical Research (Vol.-14)

DETAILS:

Published on October 2025

ABSTRACT:

Viral conjunctivitis, also known as “Eye Flu,” presents significant public health challenges worldwide. India has recently witnessed a surge in cases, affecting numerous people and causing widespread concerns. This research delves into the realm of medical image processing and deep learning to address the pressing need for accurate and efficient detection of viral conjunctivitis, a highly contagious ocular infection. Leveraging advancements in computer vision and convolutional neural networks (CNNs), the study focuses on the development and evaluation of a robust diagnostic system capable of discerning viral conjunctivitis from other common forms of conjunctivitis, namely allergic and bacterial.Challenges in using image processing for disease detection include the need for large amounts of descriptive data to train machine learning models, ensuring the accuracy and reliability of image analysis algorithms, and addressing data privacy and security concerns. Future directions in this field may include developing more advanced deep learning models that can handle complex medical imaging data, integration of imaging technology and other diagnostic tools to diagnose diseases and learn how to use it in real-time for fast processing. and more efficient diagnosis. Additionally, efforts should be made to standardize image processing protocols in different healthcare settings to facilitate sharing and comparison of medical imaging data for research and clinical purposes. Overall, more research and collaboration between medical, informatics, and image processing experts is essential in developing future image processing applications for disease detection.The methodology encompasses the acquisition of a diverse dataset comprising annotated images of ocular conditions, rigorous preprocessing techniques to standardize image quality, and the implementation of three distinct CNN architectures: ResNet, VGG, and GoogleNet. These architectures were selected for their proven efficacy in medical image analysis and classification tasks. Through extensive experimentation and rigorous validation, the research elucidates the efficacy of each architecture in accurately classifying conjunctival diseases, with a particular emphasis on delivering actionable diagnostic outcomes.

Link: https://doi.org/10.6000/1929-6029.2025.14.57

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Impact of Augmented Reality Trail on Eyewear Purchase Intentions

AUTHOR :

Jha, S.; Paliwal, M.N.; Ingale, K.K.; Singh, K.K.

JOURNAL NAME:

Springer Proceedings in Business and Economics

DETAILS:

Published on 1 October 2025

ABSTRACT:

Digital facilities are rapidly changing the user experience towards online product purchases. Technology is overall coming as an experience enhancer and value creator. In recent times, the eyewear industry has grown due to the increased number of people wearing prescribed glasses and fashion consciousness. Due to growing consciousness towards looks, people are keeping eyewear as a fashion accessory. In eyewear retail, augmented reality is mainly used in trial room services. It makes purchasing easy, saves time, and allows customers to try as many products as possible. As millennials have been exploring digital tools and this generation is also conscious of looks and makes substantial expenses towards this category, the present study will try to see how augmented reality-infused trails impact purchase intention.

Link: https://doi.org/10.1007/978-981-97-7030-4_10

Since 1983

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

The Future of Green Energy: Power Electronics in Electric Vehicles (EVs) and Renewable Energy Systems

AUTHOR :

Ishika Ahuja

JOURNAL NAME:

The Future of Green Energy: Storage, Materials, Alternative Fuels, and Net-Zero Strategies (Book Chapter)

DETAILS:

Published on September 2025

ABSTRACT:

This chapter, per the authors, explores the ongoing transition from conventional energy systems to renewable energy technologies in response to climate change, fossil fuel depletion, and global sustainability goals. It highlights key innovations in solar photovoltaics, wind turbines, energy storage, and smart grids, while analyzing the economic, regulatory, and infrastructural challenges that hinder widespread adoption. The chapter applies theoretical frameworks including the Triple Bottom Line, Technological Innovation Systems, and Socio-Technical Systems to examine green energy's technological, environmental, social, and economic dimensions. It also evaluates the role of digital tools such as machine learning, and investigates the environmental costs of materials like rare earth elements. By integrating global research and case studies, this chapter provides a comprehensive overview of green energy's future, outlining both opportunities and barriers to a sustainable energy transition.

Link: https://www.igi-global.com/chapter/the-future-of-green-energy/389039

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Enhancing Security and Efficiency in Healthcare through Decentralized and Blockchain-Based Solutions

AUTHOR :

Pise, N.N.; Kulkarni, S.

JOURNAL NAME:

Decentralized Healing (Book Chapter)

DETAILS:

Published on 29 September 2025

ABSTRACT:

Among recent advances in healthcare technologies, one of the significant challenges is to maintain the security and privacy of patient data. Due to issues such as fraudulent use of personal medical data, patients hesitate to provide their personal data to any healthcare system. Patients can be given ownership of their data and are able to check and retrieve it as and when necessary. This issue could be minimized by deploying decentralized solutions in the healthcare system. It also provides the benefit of eliminating the intermediaries and helps improve the relationship with their associates. A decentralized healthcare system represents a shift from traditional, centralized models of healthcare delivery to a more distributed approach. In a decentralized system, healthcare services, data management, and decision-making processes are spread across various nodes, including patients, healthcare providers, and technological platforms. This model leverages digital technologies such as telemedicine, blockchain, and electronic health records to provide more personalized, efficient, and accessible healthcare services. Furthermore, the components of decentralized healthcare such as blockchain technology, telemedicine and remote monitoring, and patient-centered care will be discussed in detail. Benefits of decentralization such as increased accessibility, enhanced data security and privacy, efficiency and cost-effectiveness, and empowerment of patients are covered. Finally, challenges in decentralized healthcare are elaborated.

Link: https://doi.org/10.1201/9781003546559-15

Since 1983

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

An Analysis of Cross-Lingual Natural Language Processing for Low-Resource Languages

AUTHOR :

Naik, V.; Rajeswari, K.; K.; Rahalkar, A.

JOURNAL NAME:

Lecture Notes in Networks and Systems (vol.-1415 LNNS)

DETAILS:

Published on 1 October 2025

ABSTRACT:

This study examines cross-lingual natural language processing (NLP) techniques to address the challenges of developing conversational AI systems for low-resource languages. These languages often lack extensive linguistic resources such as large-scale corpora, annotated datasets, and language-specific tools, making it difficult to capture the linguistic distinctions and contextual meaning essential for high-quality dialogue systems. This language gap restricts accessibility and inclusivity, preventing speakers of these underrepresented languages from fully benefiting from advancements in technology. The study compares various factors that affect model performance, including transformer model architecture, cross-lingual embeddings, fine-tuning strategies, and transfer learning approaches. Despite these challenges, the research shows that cross-lingual models offer promising solutions, especially when utilizing techniques like transfer learning and multilingual pre-training. By transferring knowledge from high-resource languages, these models can compensate for the scarcity of data in low-resource languages, enabling the development of more accurate, culturally sensitive, and inclusive AI systems. The findings highlight the importance of bridging linguistic divides to foster greater language diversity, accessibility, and technological inclusivity, ultimately supporting cultural preservation and revitalization.

Link: https://link.springer.com/chapter/10.1007/978-981-96-6438-2_4

Since 1983

MIT-WPU

।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Flex sensors in healthcare communication: Accessibility and interaction

AUTHOR :

Lokhande, N.; Dhamale, S.; C.

JOURNAL NAME:

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

DETAILS:

Published on January 2025

ABSTRACT:

Healthcare communication has emerged as a crucial area of research due to identified limitations in verbal communication. This research unveils a transformative approach to healthcare communication by introducing a wearable device integrating flex sensors. The device seamlessly translates sign language into text, enhancing comprehension for doctors and hospital staff in case of ICU communication and individuals with special needs. Leveraging automation and information technology, the glove-based innovation quantifies intricate finger gestures, generating text through resistance measurements and a microcontroller. This technology addresses accessibility needs, with potential applications in critical healthcare settings. The flex sensor prototype demonstrates future potential, paving the way for a comprehensive toolkit to revolutionize communication challenges in healthcare. To further enhance inclusivity, future iterations could explore integrating voice recognition for individuals with partial speech capabilities. Ultimately, this innovation aims to take a significant step toward a future where communication barriers in healthcare are minimized, leading to a more equitable and patient-centered experience.

Link: https://doi.org/10.1016/B978-0-443-31624-1.00005-8

Since 1983

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Concurrent extreme learning-based demand response optimizer for blockchain-enabled peer-to-peer energy trading in residential microgrids

AUTHOR :

Singh, A.R.; Kumar, R.S.; Ballireddy, T.R.R.; Khadse, C.B.; Bajaj, M.; Rubanenko, O.

JOURNAL NAME:

Energy Exploration and Exploitation

DETAILS:

Published on 23 October 2025

ABSTRACT:

Residential microgrids (MGs) increasingly rely on decentralized energy sources and peer-to-peer energy trading mechanisms to maintain uninterrupted power distribution. However, ensuring concurrency between dynamic energy demands and supply responses remains a critical challenge, especially under fluctuating load and availability conditions. This study proposes a novel Demand Response Optimizer Model (DROM), leveraging Concurrent Extreme Learning (CEL), and blockchain (BC)-based verification to enhance fairness, responsiveness, and efficiency in energy allocation within residential MGs. The proposed DROM incorporates a feed-forward neural network architecture, wherein demand biasing and trading weights are adaptively computed to optimize energy dispatch. A BC framework is employed for decentralized storage and validation of transactional records, preserving system transparency, data integrity, and facilitating real-time energy trading decisions. The model operates across two user categories—Type 1 (building/peer-level) and Type 2 (residential individual)—and dynamically balances demand and response by minimizing bias while maximizing weight assignments across energy requests. The system is evaluated using real-world MG simulation data. Empirical results demonstrate that the proposed model achieves a 14.62% increase in optimal energy trading efficiency and a 14.77% improvement in demand coverage for Type 2 users. Furthermore, the framework delivers a 16.11% enhancement in power distribution and a 14.01% gain in trading reliability compared to benchmark methods. These findings underscore the effectiveness of the CEL-based BC-integrated framework in addressing concurrency, demand suppression, and equitable energy sharing in decentralized smart energy networks.

Link: https://doi.org/10.1177/01445987251389761

Since 1983

MIT-WPU

॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Optimal path selection for mobile sink using Henry gas particle swarm optimisation and energy prediction based on deep residual network

AUTHOR :

Kamble, A.A.; Patil, B.M.

JOURNAL NAME:

International Journal of Bio-Inspired Computation (Vol.-26, Issue-2)

DETAILS:

Published on 13 October 2025

ABSTRACT:

The advantage of wireless sensor network (WSN) anywhere at any time makes it one of the popular technologies. Due to the limitation of wireless links, it is necessary to select the optimal path for packet transmission. The most prominent issues faced by the WSN are energy availability and reliability. The energy prediction among the nodes acts as a significant factor to achieve reliability. Hence, this research proposes a mechanism for optimal path selection of MS nodes using a proposed approach named the Henry gas particle swarm optimisation (HGPSO) algorithm. Here, the hybrid Harris hawk salp swarm optimisation (HHSSO) model along with the MS policy is employed for performing the CH selection effectively and is referred to as EE-hHHSS. The deep residual network (DRN) is exploited to predict energy. The proposed HGPSO-based DRN has achieved a maximum packet delivery ratio (PDR) of 42.121%, maximum residual energy of 0.083 J, minimum delay of 0.0000027089 sec, minimum path distance of 13.357, and maximum number of alive nodes is 48 while analysing 50 nodes.

Link: https://doi.org/10.1504/IJBIC.2025.149061

Since 1983

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Combinatorial approach integrating advanced oxidation process to the microalgal treatment for PPCP removal from wastewater

AUTHOR :

Shourie, A.; Girdhar, A.; Chapadgaonkar, S.S.; Mazahar, S.; Singh, A.

JOURNAL NAME:

In book: Advanced Oxidation Process-Based Integrated and Hybrid Technologies for Degradation of Pharmaceuticals and Personal Care Products

DETAILS:

Published on July 2025

ABSTRACT:

Pharmaceuticals and personal care products (PPCPs) are emerging pollutants that have become a matter of great concern worldwide due to their potential chronic effects on human health such as toxicity, carcinogenicity, and endocrine-disrupting properties. Most conventional wastewater treatment plants (CWWTPs) are inefficient in PPCP removal and require to be supplemented with advanced processes and hybrid techniques to completely degrade, detoxify, and mineralize the PPCPs from wastewater. Biological wastewater treatment using microalgae is increasingly becoming popular, because it shows remarkable capability of pollutant removal and CO2 mitigation and also generates biomass, which could be used as a feedstock for biofuel production, promoting sustainability and circular economy. However, high amounts of persistent PPCPs in wastewater can impose toxicity, reduce the biomass growth, and inhibit metabolic activities of microalgae, jeopardizing their bioremediation capacity. This chapter summarizes the role of microalgae in PPCP removal from wastewater and discusses its mechanisms and challenges, further suggesting novel strategies such as using microalgal–microbial consortia and genetic engineering of algae to improve PPCP removal capacity of the biological process. Further, an innovative oxidative-microalgal wastewater treatment plant (OMA-WWTP) model is proposed based on the combinatorial approach integrating advanced oxidation process (AOP) to the microalgae treatment for PPCP removal from wastewater, to enhance the PPCP removal efficiency of the WWTP sustainably.

Link: https://doi.org/10.1016/B978-0-443-21887-3.00007-9

Since 1983

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Additively manufactured stimuli responsive smart materials and structures

AUTHOR :

Kathavate, V.S.; S.; Zhu, Y.; Deshpande, P.P.

JOURNAL NAME:

In book: Additively Manufactured Smart Materials and Structures

DETAILS:

Published on January 2025

ABSTRACT:

Additive manufacturing (AM), also known as layer-by-layer manufacturing or 3D printing, finds a unique niche in materials processing/fabrication technology to fabricate various complex structures with excellent mechanical, thermal, chemical, and physical properties. In recent years, with the advent of technology, it has become possible to fabricate stimuli responsive smart materials and structures (SRSMS) using AM, thus demonstrating their applications in micro-/nano-electromechanical systems (M/NEMS), energy harvesting, robotics, and biomedical engineering. The manufacturing of SRSMS falls under 4D printing, where change in the printed configuration of the material when subjected to external stimuli over time is evident. Although much has been reported about SRSMS including their synthesis and fabrication and structural and functional properties, much less is known about their applicability at commercial scale. In the same vein, 4D printing for SRSMS, particularly shape memory alloys (SMA) and shape memory polymers (SMPs), is expected to create a major impact on product design and manufacturing transiting from static to dynamic structures. In view of this, the present chapter provides comprehensive insights into SRSMS fabricated via AM (or 4D printing) along with the underlying stimuli responsive mechanisms and integrated functionalities. We classify AM SRSMS according to the material (i.e., polymer and alloys), fabrication process, and stimuli response. At the end, we consider the present challenges and key issues in AM SRSMS comprehensively that can be addressed in near future to accelerate the design and development process of SRSMS.

Link: https://doi.org/10.1016/B978-0-443-16144-5.00017-X

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Molecular mechanisms of secondary metabolites as antidiabetic agents

AUTHOR :

P.J.; Tagalpallewar, A.A.; Pawar, A.T.; Baheti, A.M.

JOURNAL NAME:

Antidiabetic Drug Discovery from Natural Products provides (Book Chapter)

DETAILS:

Published on 13 June 2025

ABSTRACT:

Diabetes mellitus, a widespread metabolic disorder characterized by chronic hyperglycemia, poses a significant global health challenge. Although there are many synthetic medications available for the treatment of diabetes, they often come with side effects, which makes the search for better alternatives imperative. The therapeutic properties of secondary metabolites, which are bioactive substances present in plants and animals, have drawn interest because of their potential as antidiabetic agents. The antidiabetic effects of secondary metabolites are examined in this chapter along with their molecular mechanisms. A number of mechanisms are involved in the action of these compounds: they inhibit the enzymes α-amylase, α-glucosidase, and dipeptidyl peptidase-4, increase the activity of glucagon-like peptide-1 receptors, stimulate glucose transporters, activate peroxisome proliferator-activated receptors, secrete more insulin, and improve insulin sensitivity. Secondary metabolites provide potentially effective ways to manage diabetes with fewer adverse effects than conventional drugs by focusing on these pathways. This chapter emphasizes the key secondary metabolites and their sources, underlining their potential as natural antidiabetic agents.

Link: https://doi.org/10.1016/B978-0-443-30086-8.00006-1

Since 1983

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Antidiabetic potential of glycosides

AUTHOR :

Murudkar, P.H.; A.G.; Baheti, A.M.; Pawar, A.T.

JOURNAL NAME:

Antidiabetic Drug Discovery from Natural Products provides (Book Chapter)

DETAILS:

Published on 13 June 2025

ABSTRACT:

Diabetes mellitus (DM) is a metabolic disease marked by decreased insulin activity and/or secretion in the body. Long-term effects of this disorder lead to neuropathy, retinopathy, cardiomyopathy, and nephropathy. The three primary subtypes of DM are type 1 (insulin-dependent/juvenile), type 2 (insulin-independent), and gestational. Type 1 diabetes is best treated with insulin therapy, while type 2 diabetes is controlled using synthetic oral hypoglycemic medications. Long-term usage of synthetic antidiabetic medications could potentially result in unwanted side effects and adverse effects. Since ancient times, people with diabetes have been treated orally with numerous medicinal herbs or extracts. As a result, the search for safer and more effective antidiabetic medicines in plants remains a crucial area of research. The plant contains many biologically active constituents including terpenoids, alkaloids, tannins, carbohydrates, and glycosides. Several studies have been conducted for the evaluation of the antidiabetic potential of glycosides in cell lines, animals, and humans. This chapter summarizes the latest developments in glycosides that hold promise as potential antidiabetic medications.

.Link: https://doi.org/10.1016/B978-0-443-30086-8.00011-5

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Quantum-inspired multi-modal framework for real-time student engagement and performance prediction in smart learning environment

AUTHOR :

Abraham, S.; Pillai, D.; Bhosale, T.

JOURNAL NAME:

International Journal of Information Technology (Singapore)

DETAILS:

Published on 25 October 2025

ABSTRACT:

Real-time tracking and forecasting of student engagement and performance is the need of the hour in adaptive and smart learning environments especially in higher education. We introduce a Quantum-Inspired Multi-Modal Framework with three interconnected layers. The first layer commonly known as Quantum-Inspired Adaptive Signal Capture Layer which gathers multi-modal student signals and unifies it to create unique behavioral-cognitive fingerprints. The second layer- Cross-Perspective GNN (graph neural network) layer captures peer influence and tracks learning progression over time. The third layer- Hybrid Mind-Map & Predictive Analytics Layer which dynamically assesses knowledge mastery and updates performance indicators thereby making the system adaptive and holistic. The proposed framework is evaluated against baseline models and existing works such as LSTM (long-short term memory), Transformer, and Spectral FNO (Fourier neural operator) based on metrics such as predictive accuracy (%), engagement correlation, and temporal adaptability (sec). Our framework achieved 97.6% accuracy, 0.91 engagement correlation (ρ), and 3.2 temporal adaptability thereby outperforming existing studies. The results show that the proposed framework improves predictions by focusing on the complete learning environment factors like peer progress and relative performance scores for personalized learning.

Link: https://doi.org/10.1007/s41870-025-02822-4

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

An IoT-based interactive system to facilitate smart and adaptive learning in higher education

AUTHOR :

Jha, N.; Abraham, S.; Bhosale, T.; Pillai, D.; S.; Murhe, V.; S.; D.V.

JOURNAL NAME:

International Journal of Information Technology (Singapore)

DETAILS:

Published on 25 October 2025

ABSTRACT:

Higher education is undergoing a technological shift, moving towards personalized, adaptive, and data-informed real -time learning experiences. In this context, an IoT-enabled interactive system is designed to foster smart and adaptive learning within universities and schools, structured around a novel fluid three-layer framework. At its core, the proposed system integrates three modules: the Curriculum Flow Module (CFM) that delivers adaptive content in real-time while analyzing student interactions; the Knowledge Diffusion Module (KDM) which ensures smart dissemination of resources, peer recommendations, and faculty feedback; and the Viscosity Control Module (VCM) which manages cognitive load by leveraging IoT-enabled attention and stress monitoring. It enables instructors and platforms to offer custom tailored interactive and dynamic assignments that change and evolve according to their target student .To test its effectiveness, student-centered datasets such as the Open University Learning Analytics Dataset (OULAD), EdNet, and the KDD Cup 2010 are taken into consideration. The performance of the proposed system is evaluated in terms of engagement rate (ER), knowledge retention (KR), adaptability speed (AS), and dropout prediction accuracy (Acc), while also tracking energy and latency as indicators of IoT feasibility. The results are promising: engagement rates reached 82%, knowledge retention hit 78%, and adaptability speed up by 3.5× times as compared to conventional Learning Management Systems (LMS). Dropout prediction accuracy improved from 74% to 89%, all while keeping energy consumption nearly half that of baseline adaptive quiz platforms.

Link: https://doi.org/10.1007/s41870-025-02827-z

Since 1983

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Thermosensitive in situ gel powered by pectin-chitosan nanocapsules for intraocular delivery of acetazolamide: in vitro, ex vivo, and in vivo evaluation

AUTHOR :

Bagul, U.; Khot, S.; Monde, A.; Ashtekar, K.; Moni, S.; Kokare, C.; Tagalpallewar, A.A.

JOURNAL NAME:

Drug Delivery and Translational Research

DETAILS:

Published on 24 October 2025

ABSTRACT:

The current study aimed at development of acetazolamide loaded pectin-chitosan nanocapsules (APCNC) via a polyelectrolyte complex coacervation technique, further incorporated into a poloxamer 407 and HPMC-based in situ gel (APCNC-ISG). The resulting APCNC demonstrated a positive zeta potential (+ 23.45 ± 0.30 mV), high entrapment efficiency (94.33 ± 1.2%), small hydrodynamic size (104 ± 2.4 nm), and narrow size distribution (PDI < 0.3). The SEM and TEM analyses confirmed the spherical morphology and nano range size of APCNC, while XRD analysis revealed the conversion of acetazolamide from a crystalline to an amorphous state. The APCNC-ISG exhibited pseudoplastic rheology with a gelling temperature of 36 ± 0.5 °C and rapid gelation within 10 ± 2 s. Furthermore, texture analysis displayed suitable adhesive properties. In vitro drug release and ex vivo permeation studies showed a sustained drug release over an extended period. The HET-CAM test and histopathological evaluation confirmed the non-irritating and non-toxic nature of the formulation, supporting its suitability for ophthalmic use. Pharmacodynamic studies demonstrated that APCNC-ISG significantly reduced intraocular pressure and maintained the effect for a prolonged duration compared to other formulations. These findings suggest that APCNC-ISG is a promising, adaptable, and effective drug delivery system for the treatment of glaucoma.

Link: https://doi.org/10.1007/s13346-025-02002-8

Since 1983

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Temporal Evaluation of SPI and RDI for Agricultural Drought Analysis in Ahmednagar from 1981–2021

AUTHOR :

Mullapudi, A.; Patil, C.H.; Vibhute, A.D.; Mali, S.

JOURNAL NAME:

Lecture Notes in Electrical Engineering (Vol.-1420 LNEE)

DETAILS:

Published on 1 October 2025

ABSTRACT:

The Ahmednagar district of Maharashtra State has made headlines every time India has experienced a dry season. Ahmednagar is one of the areas most likely to have a meteorological dry spell due to its location and the recent lack of rainfall in comparison with the national average. The study seeks to appropriately reflect the severity of climatic dry seasons and their influence on crop productivity and food security. It examines using historical data from 1981 to 2021 to assess the accuracy and sufficiency of various drought indexes, including the Standardized Precipitation Index (SPI) and Reconnaissance Drought Index (RDI). Specific precipitation data is the primary indicator used to assess the severity of meteorological dry seasons. In this study, the RDI and SPI indicators were determined initially for 1, 3, 6, and 12 months, followed by the times of occurrences and their greatest values of these indices. Additionally, the duration of dry spells defined by values smaller than − 1 was calculated. In addition, the longest duration, the time of events and the number of dry spells, for these indices in various time series were calculated. The findings revealed that, when compared to the SPI, a lower RDI value (− 2) is estimated for categorization in similar months. Furthermore, the number of months classified as extremely dry for the RDI is larger than the SPI, whereas the occurrence frequency of months with values less than − 0.5 for the SPI is larger than RDI. The findings revealed that both indices behave similarly, but RDI is more sensitive because it considers potential evapotranspiration under similar meteorological conditions. It emphasizes the significance of monitoring and measuring drought conditions for better planning, resource allocation, and reducing the impacts of drought on rural settings.

Link: https://link.springer.com/chapter/10.1007/978-981-96-6406-1_36

Since 1983

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A review on innovative measures for improving the sound absorption of acoustic materials for broader frequency ranges

AUTHOR :

Saha, K.; Sonawwanay, P.D.; Patel, V.; Solanki, M.

JOURNAL NAME:

Noise and Vibration Worldwide

DETAILS:

Published on 21 October 2025

ABSTRACT:

This review explores various types of acoustic materials that are modified to enhance their sound absorption properties. Effective noise control relies on materials with high sound absorption coefficients (SAC) across a wide frequency range. Porous materials, such as foams and fibrous structures, are commonly used for mid to high-frequency absorption, while resonator-based materials, including Helmholtz resonators and micro-perforated panels, target low-frequency sounds. Natural fibres offer a sustainable alternative, and composite materials combine different mechanisms for broader spectral absorption. To further improve performance, materials can be modified physically (e.g., structural alterations), chemically (e.g., treatments or coatings), or through advanced techniques such as nanotechnology and additive manufacturing. Mathematical models help analyse their acoustic behaviour, guiding material optimization. This review highlights the ongoing advancements in acoustic materials, emphasizing the need for innovative modifications to meet modern noise control challenges in architectural, industrial, and automotive applications.

Link: https://doi.org/10.1177/09574565251391216

Since 1983

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Cellulose-supported 3d-transition metal-nanostructures (M-NSs) for mitigation of organic pollutants

AUTHOR :

Shaw, R.; Agarwal, R.

JOURNAL NAME:

Cellulose

DETAILS:

Published on 22 October 2024

ABSTRACT:

Organic pollutants such as dyes, nitro compounds, and halogenated substances are highly toxic, persistent, and often resistant to natural degradation. Therefore, the development of cost-effective, reusable, and environmentally friendly catalysts for the mitigation of organic pollutants is both urgent and essential. This article presents a comprehensive overview of cellulose-supported 3d-transition metal nanocatalysts developed for environmental remediation, focusing on their synthesis, efficiency, and reusability in the degradation of hazardous organic pollutants. It highlights the use of cellulose-based supports, such as carboxymethyl cellulose and cellulose acetate, to enhance the stability and catalytic performance of metal nanostructures, including Fe, Co, Ni, Cu, and bimetallic combinations like Ni–Fe and Cu-Fe. The catalysts demonstrated significant efficacy in reducing toxic compounds like various nitrophenols, dyes, and organohalides, and pharmaceuticals, achieving high reduction rates and maintaining activity across multiple recycling cycles. The document also discusses the kinetics of these reactions, emphasizing pseudo-first-order behavior, and the impact of various parameters such as temperature, pH, and catalyst composition on performance. Additionally, it explores the mechanisms underlying the catalytic processes, including electron transfer and the role of reducing agents. Overall, this work underscores the potential of cellulose-supported nanocatalysts as effective and sustainable solutions for mitigating environmental pollution. Graphical abstract.

Link: https://doi.org/10.1007/s10570-025-06822-2

Since 1983

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Sustainable bioenergy from waste: Photo-fermentative production of biohydrogen and biomethane

AUTHOR :

Sharma, S.; Meena, P.K.; Tripathi, A.K.; Burande, C.G.; Wagle, C.S.; Rawat, P.

JOURNAL NAME:

Environmental Progress and Sustainable Energy

DETAILS:

Published on 22 October 2025

ABSTRACT:

The depletion of fossil fuels and their environmental impacts has accelerated the search for clean, sustainable energy alternatives. Photo-fermentation has emerged as a promising approach for bioenergy generation, particularly in producing biohydrogen and biomethane from organic waste and wastewater. This article examines the biological and technological aspects of photo-fermentative biohydrogen production, including feedstock selection, factors influencing yield, and strategies for optimization. It further explores photo-fermentative biomethane production—an area less frequently reviewed—highlighting key processes and enhancement techniques. A comparative assessment of the two pathways addresses production mechanisms, feedstock efficiency, environmental benefits, and economic feasibility. The review identifies current challenges, recent advancements, and future directions for photobiological hydrogen and methane as sustainable energy sources.

Link: https://doi.org/10.1002/ep.70141

Since 1983

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

IoTaaS: An Internet of Things as a Service Framework for Virtual Experimentation

AUTHOR :

Bhise, S.; Mehta, D.; Apune, S.; Nagare, A.; Salvi, S.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1929 LNNS)

DETAILS:

Published on 1 October 2025

ABSTRACT:

This paper presents the design and implementation of a Virtual IoT Lab to address the infrastructural and accessibility challenges in IoT education, particularly in rural schools, where economic and organizational constraints limit access to scientific and technological equipment, thereby hindering STEM engagement. By leveraging the IoT as a Service (IoTaaS) model, the system integrates cloud computing features, enabling ubiquitous access and resource utilization. A simple interface allows students to authenticate and select from a list of experiments, supplemented by theoretical insights before engaging in hands-on virtual simulations. The proposed system builds and integrates low-cost IoT experiments with a queuing mechanism to optimize hardware utilization while maintaining stability and fairness. The frontend and physical IoT components are connected via Web of Things (WoT) APIs. The proposed system was evaluated against traditional physical IoT labs. The proposed system demonstrates better performance compared to traditional system based on various parameters, thus bridging the digital divide and democratizing IoT-based STEM education for underprivileged students.

Link: https://link.springer.com/chapter/10.1007/978-3-032-05548-4_13

Since 1983

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Predictive Analytics to Evaluate High-Impact IPOs for Sustainable Value Creation

AUTHOR :

Srivastava, S.P.; Paralkar, T.A.; Sharma, A.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1929 LNNS)

DETAILS:

Published on 1 October 2025

ABSTRACT:

The Indian IPO market is considered a unique marketplace, as far as other developed countries' markets are concerned, due to the inherent characteristics of the Indian IPO setup. Retail investors significantly contribute to the effective price discovery of IPOs; yet, not all IPOs yield profits. Literature highlighted the pre-issue uncertainties of IPOs. This study has examined the systemic risk aspect of technology-focused IPOs from 2014 to 2023. Research indicates that IPO performance declines after listing. Indian regulators have prioritised minimising risk in IPOs to guarantee strong participation from regular investors. With the advent of the IT-based asset-light business model in Industry 5.0, their IPO issues are regularly hitting the market, and positive long-run performance depends on the riskiness of these IPOs. This study has very high social relevance as it recommends the optimum timing of IPO investment for retail investors. It also advocates that the Indian capital market regulator take measures to ensure robust post-listing IPO performance.

Link: https://link.springer.com/chapter/10.1007/978-981-96-4319-6_3

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Sentiment Analysis for Indian Languages: A Survey of Current Scenario: Recent Applications of Artificial Intelligence and Machine Learning

AUTHOR :

Goje, S.P.; Patil, R.H.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.-1929 LNNS)

DETAILS:

Published on 1 October 2025

ABSTRACT:

Nowadays, most peoples are using Internet and giving their opinion or sentiment on various issues, products, services, etc. Most of the time, the opinion or sentiment are expressed in written text along with the emoticons. There are various ways by which people are expressing their opinion or sentiment which is either having positive, negative, or neutral polarity. Due to availability of Internet and smartphone, huge data are generated which is needs to be analyzed, to make proper decision. The sentiment analysis process encompasses several critical stages: Gathering or retrieving data, pre-processing it, representing it as vectors with feature selection, and classifying sentiment using a range of algorithms such as machine learning (ML), deep learning (DL), lexicon-based methods, or hybrid techniques. This paper aims to review the latest research in sentiment analysis for Indian languages and to identify potential future directions to enhance existing methods or develop new approaches to address the various challenges and limitations in sentiment analysis for Indian languages.

Link: https://link.springer.com/chapter/10.1007/978-981-96-4319-6_37

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Crab Age Prediction Using Advanced Machine Learning Techniques

AUTHOR :

Khekare, G.; Sakarkar, G.; Patil, P.; Shelar, V.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1929 LNNS)

DETAILS:

Published on 1 October 2025

ABSTRACT:

This research focuses on innovatively predicting crab age using machine learning techniques, relying heavily on their physical attributes such as sex, length, diameter, height, and various weight measures. With commercial crab farming as a backdrop, the objectives set forth include the development of a robust predictive model that can harness a textual dataset in CSV format, implement advanced feature engineering techniques to enhance accuracy, and apply classical regression analytics to understand the relationships between these physical features and age. To achieve these goals, the research employs rigorous methodologies such as data preprocessing, extensive feature engineering, exploration of various regression algorithms, model training and evaluation, and feature importance analysis. This approach is underpinned by the significance of aiding crab farmers in their harvest decisions, contributing to sustainable aquaculture, and understanding the interrelation between crab size, weight, and age. Preliminary reviews of past literature indicate a gap in utilizing such an approach, making this study paramount in the realm of sustainable crab farming. The outcomes of this research not only serve the aquaculture industry but also pave the way for future studies, highlighting the vast potential of machine learning techniques in real-world scenarios.

Link: https://link.springer.com/chapter/10.1007/978-981-96-4319-6_34

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Exploration of Multiscale Modeling on Functionally Graded Materials in Bone Remodeling: A Review

AUTHOR :

P.; S.; Dhatrak, P.

JOURNAL NAME:

Journal of Bionic Engineering

DETAILS:

Published on 21 October 2025

ABSTRACT:

Mechanical loading constitutes a fundamental determinant in the process of bone remodeling. This modeling encompasses the incorporation of mechanical stimuli, the involvement of cellular and molecular constituents, as well as the utilization of sophisticated computational methodologies. Such an approach is imperative for forecasting bone behaviour across varying environmental conditions. In the present study, key findings from bone mechanobiology are reviewed, along with the possibility that Functionally Graded Materials (FGM) enhances osseointegration and lowers the stress-shielding effect during bone remodeling and compared to titanium, FGM improves periprosthetic bone remodeling. To summarise some of the most important findings from computational models of bone mechanobiology, explaining how modifications to the mechanical environment affect implant design, growth of bone, and bone response. The impact that changes related to the mechanical environment have on bone response is examined using computational models and methods such as surface microtopography to determine how an implant's bone density has increased over time. This review focuses on the refinement of advanced simulation frameworks and their synergy with imaging technologies to strengthen model validation, ultimately resulting in better clinical outcomes in the context of bone health treatments.

Link: https://doi.org/10.1007/s42235-025-00792-8

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A Comparative Analysis: Between Arnold and V-Ray Rendering Engines Using Maya Software

AUTHOR :

Santhalia, B.B.

JOURNAL NAME:

Lecture Notes in Mechanical Engineering

DETAILS:

Published 30 September 2025

ABSTRACT:

The research aims to evaluate the images made with two different rendering engines in Maya software, Arnold and a third-party plugin named V-Ray, which is widely used in educational, 3d animation film, architecture, games, and many computer art purposes. Rendering engines are critical tools in 3D software, enabling the creation of visually stunning and realistic images. Two popular rendering engines, Arnold and V-Ray, have garnered significant attention in the industry due to their advanced features and exceptional performance. In this paper, a comparison of two rendering engines within Maya software shows the subjective and objective of the end products. Also checking of hardware usage, calculating the render time, and concluding which renderer will be preferred for a given scene. It was found that the quality of V-Ray rendering is better than Arnold's. Rendering time depends upon the rendering engine, the system's hardware configuration, and the total number of 3D objects, vertices, lights, materials, HD textures, and samples used in shadows.

Link: https://doi.org/10.1007/978-981-96-7312-4_15

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Artificial intelligence for sustainable environmental management in the mining sector: A review

AUTHOR :

Bhambare, P.S.; Kaulage, A.; Darade, M.M.; Govindarajan, G.; Dixit, S.M.; Masthan Vali, P.S.N.; Chougule, S.M.; Kurhade, A.S.; Mali, C.N.

JOURNAL NAME:

Applied Chemical Engineering (Vol.-8, Issue-3)

DETAILS:

Published on 18 September 2025

ABSTRACT:

Importance: The mining industry must balance global resource demand with the urgent need to reduce environmental impacts such as air pollution, water contamination, soil degradation, and greenhouse gas emissions. Artificial Intelligence (AI) offers powerful tools to support sustainable practices by enabling predictive analytics, monitoring, and optimization. Research Gap: While AI's potential for sustainability is recognized, existing research rarely provides systematic analysis of its specific applications in mining. Gaps remain in evaluating performance benchmarks, addressing integration challenges, and considering ethical and regulatory issues. Objective: This review examines AI applications in mining with a focus on their role in mitigating environmental impacts, identifying both opportunities and limitations in advancing sustainable operations. Methodology: The study synthesizes peer-reviewed literature and case studies, covering AI use in air quality monitoring, water resource management, soil restoration, tailings stability, energy optimization, digital twins, and ecosystem modelling. Key Findings: AI systems have achieved notable results, including >90% accuracy in slope stability prediction, 25% reduction in wastewater treatment costs, and 8–12% fuel savings through reinforcement learning. Persistent barriers include data scarcity, high computational energy demands, integration with legacy systems, and limited interpretability of deep learning models. Implications: This review highlights AI's potential to significantly reduce the environmental footprint of mining if implemented responsibly. Approaches such as explainable AI, federated learning, and energy-efficient frameworks are essential to ensure transparency, scalability, and sustainable long-term adoption.

Link: https://doi.org/10.59429/ace.v8i3.5756

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Bioactive-Based Nanocarriers in Management of CNS Diseases

AUTHOR :

Satish, S.; Khuspe, P.; Gholap, A.; Aldar, P.; Godbole, M.

JOURNAL NAME:

Bioactive-Based Nanotherapeutics (Book Chapter)

DETAILS:

Published on 10 July 2025

ABSTRACT:

The treatment of illnesses of the central nervous system (CNS) has shown considerable promise in recent years thanks to the science of nanomedicine. Bioactive-based nanocarriers have emerged as a particularly groundbreaking and successful tactic among the numerous nanomedicine techniques. These nanocarriers offer a sophisticated platform for precise drug administration, offering a groundbreaking answer to one of the most difficult problems in CNS disorder treatment, bridging the blood–brain barrier (BBB). This chapter explores the broad potential and therapeutic implications of bioactive-based nanocarriers in the management of CNS diseases, with a focus on stroke, brain tumors, neurodegenerative diseases, and traumatic brain injuries. Therapeutic substances can be enclosed into nanocarriers by taking use of their special qualities, protecting medications from premature deterioration and enabling regulated release at the intended site of action within CNS. The chapter also covers the fundamentals of designing nanocarriers, describing the many kinds of nanocarriers and their benefits for CNS medication delivery. Additionally, the methods for overcoming BBB penetration difficulties are covered, giving light on modern research that strives to enhance the transport efficiency of nanocarriers. The chapter provides insights into the present state of research and development in the subject by covering the most recent preclinical and clinical developments. It ends with a look toward the future, stressing the enormous potential of this cutting-edge strategy and its potential to fundamentally alter how CNS illness care is practiced going ahead. Bioactive-based nanocarriers have significant promise in enhancing the lives of millions affected by CNS illnesses globally as continuing research continues to uncover new possibilities and overcome obstacles.

Link: https://doi.org/10.1002/9781394287345.ch13

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Exploring Predictive Risk Factors for Myocardial Injury in Children Treated with Anthracyclines: A Pilot Study

AUTHOR :

Lee, T.; Douglass, D.; Stine, K.; Phanavanh, B.; George, N.; Vijay, V.; Fuscoe, J.C.; Desai, V.G.

JOURNAL NAME:

Cardiovascular Toxicology

DETAILS:

Published on 17 October 2025

ABSTRACT:

Anthracycline-induced cardiotoxicity poses a threat to the long-term heart health of childhood cancer survivors; however, early risk assessment remains challenging due to limited predictive tools. While risk prediction models have been developed for chemotherapy-related hematological toxicity in pediatric cancer patients, research efforts addressing anthracycline-induced cardiotoxicity in this population remain limited. To fill this gap, we conducted a pilot study to develop a risk prediction model for anthracycline-induced cardiotoxicity in children. Using a paired-sample design, we analyzed data collected throughout treatment from 18 children receiving anthracycline-based chemotherapy. Patient demographics, clinical features, and treatment regimen served as input (explanatory) variables, while plasma concentration of high-sensitivity cardiac troponin T was used as the outcome (response), representing anthracycline-induced myocardial injury. Of the initial 33 potential variables, the top 18 were selected based on their importance scores in relation to myocardial injury. This set was further refined to 13 by removing redundancies using the caret package in R to develop a preliminary logistic regression model. A Leave-One-Patient-Out Cross-Validation identified four key predictors for the final model: sex, age at diagnosis, total cyclophosphamide dose (mg), and days since the first anthracycline dose. All were significantly associated with myocardial injury. The final logistic regression model achieved an accuracy of 85%, a sensitivity of 80%, a specificity of 88%, an area under the curve of 0.89, and a Youden's index of 0.68 for predicting myocardial injury risk. These preliminary findings suggest the potential of our predictive model to stratify risk of anthracycline-induced myocardial injury in the pediatric population.

Link: https://doi.org/10.1007/s12012-025-10065-9

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Airline Ticket Price Prediction using Wavelet Enhanced Hybrid Forecasting Model Approach

AUTHOR :

Rao, M.; Pathak, P.; Bokhare, A.; Ahirrao, G.; Bhardwaj, A.; Rane, H.; Satone, H.

JOURNAL NAME:

Conference: 2025 International Conference on Innovations in Intelligent Systems: Advancements in Computing, Communication, and Cybersecurity (ISAC3)

DETAILS:

Published on 15 September 2025

ABSTRACT:

The exponential growth of air travel has increased the demand for accurate airline ticket price and demand forecasting systems. This research presents a hybrid machine learning model combining wavelet decomposition with extreme gradient boosting (XGBoost) to predict airline ticket prices for both Economy and Business classes. The model pre-processes and decomposes historical ticket pricing data to capture nonlinear and high frequency trends, enabling better generalization and prediction accuracy. Furthermore, the integration of Monte Carlo simulation (MCS) introduces uncertainty modelling, allowing the system to forecast not only point estimates but also probabilistic ranges. The approach addresses real-world challenges such as market volatility, seasonal demand shifts, and class-specific pricing patterns. The proposed model is evaluated using standard metrics like Root mean square error (RMSE), mean absolute error (MAE), and R2, and results indicate a significant performance improvement over baseline models. Visualizations including prediction intervals, histograms, and actual vs predicted graphs substantiate the model's effectiveness.

Link: https://doi.org/10.1109/ISAC364032.2025.11156364

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Comix - A Deep Learning Approach to Automated Educational Comic Creations

AUTHOR :

Pasalkar, R.; Salunkhe, A.; Kulkarni, R.; Patil, A.; Bhagat, D.

JOURNAL NAME:

Conference: 2025 International Conference on Innovations in Intelligent Systems: Advancements in Computing, Communication, and Cybersecurity (ISAC3)

DETAILS:

Published on 15 September 2025

ABSTRACT:

Effective child education necessitates innovative and captivating methods. In this paper, we present Comix, a system that uses deep learning to turn videos into child-friendly comic strips. Video processing, feature extraction, keyframe selection via temporal and aesthetic analysis, cartoon-style transformation, speech-to-text conversion, and text placement within comic panels are all steps in Comix's multi-stage pipeline. Comix transforms complex video content into an engaging and easily assimilated comic format by fusing simplified narratives with visual storytelling driven by deep learning. Our results show that, while preserving the main idea of the original material, the system greatly improves accessibility, engagement, and comprehension among children. This study demonstrates how deep learning has the potential to completely transform the way that educational content is delivered by offering a scalable method for turning video-based information into visually captivating comic narratives.

Link: https://doi.org/10.1109/ISAC364032.2025.11156259

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Lung Cancer Classification from CT Scans using Deep Learning Techniques

AUTHOR :

Iyengar, S.; Joshi, D.; Rao, M.; Bokhare, A.; Mete, S.; Apune, S.; Nagare, A.

JOURNAL NAME:

Conference: 2025 International Conference on Innovations in Intelligent Systems: Advancements in Computing, Communication, and Cybersecurity (ISAC3)

DETAILS:

Published on 15 September 2025

ABSTRACT:

Lung cancer remains the leading cause of cancer-related mortality globally, with late-stage diagnosis significantly reducing survival rates. This paper presents a robust deep learning framework for classifying lung CT scans into three clinically critical categories: benign, malignant, and normal cases, using the IQ-OTHNCCD dataset. Our convolutional neural network (CNNs) architecture incorporates batch normalization and strategic dropout layers to enhance feature learning while mitigating overfitting, a common challenge in medical image analysis. The model leverages extensive data augmentation to address dataset limitations and class imbalance, achieving an accuracy of 94.3% on the test set. Comparative analysis demonstrates that our approach outperforms existing methods in multi-class classification while maintaining computational efficiency. The proposed system shows strong potential as a decision-support tool for radiologists, particularly in resource-constrained settings where expert availability is limited.

Link: https://doi.org/10.1109/ISAC364032.2025.11156806

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Automated Liver Lesion Segmentation with Deep Learning Model

AUTHOR :

Patil, H.A.; Thengade, A.

JOURNAL NAME:

Conference: 2025 International Conference on Innovations in Intelligent Systems: Advancements in Computing, Communication, and Cybersecurity (ISAC3)

DETAILS:

Published on 15 September 2025

ABSTRACT:

Proper segmentation of liver lesions is important with regards to computer aided diagnosis and treatment by means of hepatic diseases. Nevertheless, the current models can fail in identification of tiny, poor-contrast, and asymmetric lesions that might have limited feature representation or over-expensive computation. In this paper, a new and efficient deep convolutional neural network (DCNN) architecture is proposed that uses depth wise separable convolutions so that the feature extraction ability can be improved, meanwhile, the model is highly simplified. The model includes batch normalization and dropout layers that have been integrated to enhance stability and generalizability in the data-scarce medical settings regarding training. It is a sparse architecture with effective performance in capturing the finer-grained details of a lesion. Testing on the public LiTS dataset proves the better performance of the model which attains a Dice Coefficient of 0.8209, IoU of 0.7007, Precision of 0.8454, Recall of 0.8054, and F1 Score of 0.8209 and the test loss is low with a value of 0.2095. The overall performance is highly beneficial with better segmentation accuracy and the accuracy of delineating the boundaries compared with conventional models; hence comparative analysis. The framework is suitable and can be implemented in real-time in clinical decision-support systems because it has a potential trade-off between the performance and the efficiency. This is a contribution in terms of a solid and scale computation in liver lesion segmentation, which is a contribution to the application of deep learning to AI in radiology.

Link: https://doi.org/10.1109/ISAC364032.2025.11156836

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Intelligent Attention-Based Transformer Models for Text Extraction: A Proof of Concept

AUTHOR :

Panicker, S.S.; Bankar, A.; Shinde, R.; Mondal, S.; Jadhav, R.; Nair, A.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1286 LNNS)

DETAILS:

Published on 1 October 2025

ABSTRACT:

Recently advancements in natural language processing have revolutionized dealing with massive textual data, information extraction (IE) is a natural language processing task centered around automatically retrieving organized data from unstructured or semi-structured text. Its aim is to recognize particular details, including entities, relationships and events, from textual materials to enrich structured databases or knowledge bases. Named Entity Recognition, on the other hand, is a subset of information extraction dedicated to pinpointing and classifying named entities present in text. The inability of rule-based algorithms to intelligently make decisions paved the way for research on developing algorithms that include semantic and syntactic modes of evaluation. Current work deals with Named Entity Recognition (NER) applied on real-time unstructured clinical insurance data. Using NER, keywords are extracted and classified into semantic categories. This task was extended to extract essential entities from the raw clinical text. In this paper, we propose system to integrate the real-world clinical insurance data acquired from different geographical locations as well as varied timelines. After successful Data Integration, we plan to apply NER inorder to obtain domain-specific tags, which can be used in long future. Current work presents proof of concept of dealing with the raw data acquired presently from one client. To assess the impact of various transformer models, we experimented with three transformers: BERT, DistilBERT and RoBERTa. A comparative analysis of their results in extracting pertinent information from the enormous textual data is presented in this work. Results are encouraging, and it is observed that RoBERTa outperformed the other two algorithms to deduce relevant information with a high F1 score of 90.45. Promising results achieved in this work shall tremendously pave path for fellow researchers in conducting research in the challenging area of healthcare

Link: https://link.springer.com/chapter/10.1007/978-981-96-4008-9_31

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

MediAI: A Comprehensive AI-Powered Medical Diagnosis System

AUTHOR :

Deshpande, G.; Devare, T.; Govardhan, Y.; Pendse, A.; Kosamkar, P.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1333 LNNS)

DETAILS:

Published on October 2025

ABSTRACT:

This project aims to develop a comprehensive AI-powered medical diagnosis system structured into three distinct modules. Initially, the system will focus on analyzing current symptoms and medical history to suggest potential diagnoses for prevalent conditions such as the common cold, fever, and asthma. Building upon this foundation, the second module will introduce X-ray analysis capabilities to enhance diagnostic accuracy. Finally, the third module will integrate findings from both symptom-based and X-ray-based analyses, providing more nuanced and accurate diagnoses. Machine learning algorithms will drive each module, leveraging anonymized and ethically sourced public datasets for model training. The ultimate goal is to create an integrated application that assists healthcare professionals in improving diagnostic efficiency and accuracy. This user-friendly application will streamline the diagnostic process, offering quick access to comprehensive diagnostic insights derived from both symptom-based and radiological assessments. Furthermore, the symptom models, employing Logistic Regression and SVM algorithms, achieved notable accuracies ranging from 92 to 99%. Additionally, the results from the image module demonstrated promising performance, with a train accuracy of 99.02% and a test accuracy of 88.58%. These outcomes underscore the effectiveness and potential of the developed AI-powered diagnostic system.

Link: https://doi.org/10.1007/978-981-96-4536-7_11

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Machine Learning for Monitoring Wind Turbines

AUTHOR :

Annadate, P.; Mirasdar, I.; Bedekar, M.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1324 LNNS)

DETAILS:

Published on October 2025

ABSTRACT:

The integration of Internet of Things (IoT) technology for monitoring wind turbines has emerged as a pivotal advancement within the renewable energy sector. Wind energy has enormous potential to meet the rising global energy demand with high efficiency and reliability, while also reducing environmental deterioration. Industry 4.0, characterized by the convergence of IoT, AI, and data analytics, has the ability to revolutionize energy production. The authors explore the application of IoT-driven machine learning models for predictive maintenance of wind turbines, leveraging data from SCADA systems. The study employs a RandomForestRegressor to forecast wind turbine performance and a GradientBoostingRegressor to identify optimal energy generation hours. Data quality and relevance are ensured through data preprocessing, feature engineering, and exploratory data analysis. Results demonstrate a high predictive accuracy, with R-squared values of 0.973 and 0.946 for active power output and energy prediction models, respectively. Predictive maintenance models achieved an accuracy of 0.955, underscoring their effectiveness in minimizing downtime and reducing maintenance costs. The analysis identified wind speed as a critical factor in energy generation, with the optimal hour for energy production pinpointed at 20:00. This research highlights the transformative impact of IoT and machine learning in optimizing wind turbine operations, providing actionable insights for enhancing renewable energy efficiency and sustainability.

Link: https://doi.org/10.1007/978-981-96-4142-0_36

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Predictive Maintenance for Automotive Health Using Machine Learning

AUTHOR :

Amune, A.; Musale, V.; Kasurde, S.; Nimale, S.; Surdas, S.; Tayde, S.

JOURNAL NAME:

Lecture Notes in Networks and Systems (vol.- 1377 LNNS)

DETAILS:

Published on October 2025

ABSTRACT:

Predictive maintenance is an early-diagnosis-based approach for upholding machine health by resolving potential problems in advance. It has a significant role in the automotive sector due to its cost savings. Predictive maintenance for automotive vehicles allows users to identify whether an automotive vehicle needs maintenance at a given instance. Generally, abnormalities in various parameters associated with these vehicles are used for this purpose, while the methodology for detecting such abnormalities may vary. This approach also helps predict the potential lifespan of these vehicles. Machine learning is one of the most crucial methods that can help achieve this. A machine learning-based system for the early prediction of the need for maintenance of automotive vehicles is presented in this paper. Models accurately learn various trends and relations between these parameters and automotive health. The trained and tested models include Random Forest, Decision Trees, K-Nearest Neighbors, Naïve Bayes, and others on the Engine Health dataset. A preprocessing pipeline, precisely curated for this dataset, is also presented. A novel accuracy of 76% was obtained, which is significantly higher than all the previously proposed methods on the Engine Health dataset. Finally, a prototype and some practical deployment methodologies for the proposed models are discussed as a proof of concept.

Link: https://doi.org/10.1007/978-981-96-5370-6_27

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Machine Learning—Book Recommendation Using KNN

AUTHOR :

Bokhare, A.; Pabalkar, V.; Salunkhe, R.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1322 LNNS)

DETAILS:

Published on October 2025

ABSTRACT:

The machine learning is the study of statistical models and algorithms in a scientific setting. In this study, we have employed unsupervised algorithms such as KNN and matrix factorization as machine learning methods. The book's dataset is utilized in the book recommendation system. Suggestion technique is a sorting procedure that was formerly utilized for group selection and material-based sorting. A pattern filtering technique is used to direct a customer to the "rank" or "first option" of an element. The information gathered during the suggestion process was about either the customer's initial choice on an odd subject related to films, literature, travel, television, and business, among other things. On the other hand, a good book suggestion system design incorporates the customer's prior scores or background. The method of measuring and processing categories across user opinions is known as cooperative sorting. Collaborative filtering collects numerous users' book ranks or preferences, and then recommends books to different people depending on their previous interests and preferences. K-Means on the book dataset, or K-Nearest Neighbor is used to produce the best possible result. The information is spread and ends in a large number of matrices in previous methodologies, whereas the information is collected throughout the suggested technique and finishes in a small number of groupings. Based on a variety of characteristics, the preferred framework predicts a customer's demand for a book. These customers' perceptions of one another will be influenced.

Link: https://doi.org/10.1007/978-981-96-4136-9_7

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Comparative Analysis of Machine Learning Models for Early Heart Disease Diagnosis

AUTHOR :

Khande, R.; Ayadi, W.; Bhandhari, N.; Farhat, Y.; Metkewar, P.S.; Shukla, S.R.; Rather, A.A.; Lone, M.A.

JOURNAL NAME:

International Journal of Statistics in Medical Research (Vol.-14)

DETAILS:

Published on October 2025

ABSTRACT:

Heart disease remains among the leading causes of death worldwide, and its early detection ability can be the difference between life and death. In this research, we investigate the capability of machine learning—namely Support Vector Machines (SVM)—to predict the occurrence of heart disease based on regular clinical information. We used the Cleveland Heart Disease dataset, which contains critical patient data like age, gender, blood pressure, cholesterol level, type of chest pain, and other crucial health factors. Prior to creating our model, we pre-processed and cleaned the data by dealing with missing values, changing categorical variables into numerical form, and scaling the features for uniformity. We then optimized the SVM model using grid search and cross-validation to make it run at its optimal level. The resulting model had an accuracy of 86.41% in the test set and performed better than other popular models such as logistic regression and random forest.The significant about this work is the potential for applying it in practical situations. An SVM-based program such as this could be a second opinion for physicians or integrated into early diagnostic tools—most helpful in clinics with limited access to specialists. It's progress toward smarter, data-driven healthcare that enables faster and more precise diagnoses.

There's still potential for expansion, using bigger, more varied datasets or incorporating real-time patient information could further enhance the model. But this research demonstrates that with the proper data and methodology, machine learning can be a useful tool in the early diagnosis of heart disease.

Link: https://doi.org/10.6000/1929-6029.2025.14.56

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Revisiting human capital and income inequality in India: asymmetric effects and policy implications using NARDL framework

AUTHOR :

Ansari, T.H.; Ansari, Z.I.; Khan, W.A.

JOURNAL NAME:

International Journal of Sociology and Social Policy

DETAILS:

Published on October 2025

ABSTRACT:

Purpose It is widely recognized that the relationship between income level, income inequality, and the impact of public goods on health and education is complex and mutually dependent. Yet, existing studies often fail to capture how increases and decreases in such investment have uneven effects on income distribution. This study aims to analyze the impact of human capital on income inequality in India, recognizing the multi-directional relationship between public investment in human capital and income distribution outcomes. Design/methodology/approach This research examines how the asymmetric nature of human capital influences income inequality in India by employing the nonlinear autoregressive distributed lag (NARDL) model, which utilizes data spanning from 1990–91 to 2019–20. Control variables include GDP per capita, poverty gap, inflation rate, and population growth rate. Findings The findings indicate a notable long-term asymmetric influence of human capital on income disparity. Notably, increased education expenditures in India are associated with rising income inequality, underscoring the role of quality and access disparities in education systems. Health expenditures show an inverse pattern, with spending cuts leading to heightened inequality. These findings underscore the importance of equity, access, and efficiency in public investment. Originality/value To the best of the authors' knowledge, this is the first study to jointly examine the asymmetric effects of both education and health expenditures on income inequality in India using the NARDL framework. It contributes new empirical insights by extending the time series to 2019–20 and taking into account recent policy shifts. The study offers policy-relevant guidance on how direction-specific investment in human capital shapes inequality dynamics.

Link: https://doi.org/10.1108/IJSSP-04-2025-0259

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Market Demand-Driven Forecasting of Diamond Prices using ARIMA and LSTM Approaches

AUTHOR :

Amadavadi, K.; Rane, R.

JOURNAL NAME:

Conference: 2025 5th International Conference on Soft Computing for Security Applications (ICSCSA)

DETAILS:

Published on August 2025

ABSTRACT:

Accurate prediction of diamond prices is vital for consumers, retailers, and investors. However, price fluctuations are influenced not only by diamond features such as carat, cut, and clarity but also by external market dynamics and seasonal demand patterns. In this study, we forecast diamond prices using two prominent techniques: the AutoRegressive Integrated Moving Average (ARIMA) model and Long Short-Term Memory (LSTM) neural networks. The dataset, originally sourced from Kaggle, lacked a temporal structure. To overcome this, we introduced a synthetic time series by adding demand-driven labels and assigning dates based on seasonal price behavior. To reflect actual market behavior, high-value diamonds were associated with peak demand periods, particularly between November and February. For forecasting purposes, both ARIMA and LSTM models were applied to predict diamond prices for the upcoming January and the subsequent year. Their performance was compared using 2017 data as a baseline. The ARIMA model, configured with parameters (p=9, d=0, q=1), demonstrated superior accuracy over the LSTM model with a time step of 30. Specifically, ARIMA achieved lower error metrics, with a Mean Absolute Error (MAE) of 4245.53 and a Root Mean Squared Error (RMSE) of 4985.35, compared to the LSTM's MAE of 4907.62 and RMSE of 5561.07. These findings suggest that ARIMA is more effective for short-term diamond price forecasting in this context.

Link: https://doi.org/10.1109/ICSCSA66339.2025.11170881

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

IoT-based Smart Energy Monitoring and Forecasting using Long Short-Term Memory and Cloud Integration

AUTHOR :

Amune, A.; Rajurkar, S.; Pawar, A.; Rane, S.; Pichare, P.; Shendre, R.; Musale, V.

JOURNAL NAME:

Conference: 2025 3rd International Conference on Sustainable Computing and Data Communication Systems (ICSCDS)

DETAILS:

Published on August 2025

ABSTRACT:

This paper describes a combined Internet of Things (IoT) and machine learning approach to enable energy efficiency in smart homes. It has been established that intelligent systems to reduce energy waste, lower operational costs, and lead to sustainable consumption habits are necessary. The use of electric vehicles, battery storage, and a detailed Home Energy Management Systems (HEMS) framework, provides high sampling frequency data and analysis. This approach allowed the HEMS framework to perform dynamic forecasting in conjunction with automatic fault detection, using the LSTM AI algorithms trained on sensor readings. Overall, the results indicate that the framework was able to improve energy performance of households and support sustainable operation and predictive maintenance for future homes.

Link:
https://doi.org/10.1109/ICSCDS65426.2025.11166789

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Low-Cost Ground Station Design for NOAA APT signal reception using SDR

AUTHOR :

Choudhary, M.; Tambekar, R.

JOURNAL NAME:

2025 IEEE Space, Aerospace and Defence Conference, SPACE 2025

DETAILS:

Published on 25 September 2025

ABSTRACT:

This study presents the design and testing of a V-dipole antenna, Quadrifilar Helix Antenna (QHA) and Turnstile Antenna for receiving NOAA satellite signals using RTL-SDR. The V-dipole, a simple and effective design, provided strong reception under optimal satellite pass conditions, while the QHA, with its circular polarization, ensured more stable signals. Signals were acquired using SDR++ and decoded using SatDump and NOAA APT, successfully capturing Automatic Picture Transmission (APT) images. Results confirm that low-cost, student-built antennas can effectively receive weather satellite data, demonstrating the potential of SDR-based ground stations for real-time meteorological applications.

Link: https://doi.org/10.1109/SPACE65882.2025.11171258

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Design and Implementation of a Student-Built Ground Station Antenna in CanSat

AUTHOR :

Choudhary, M.; Tambekar, R.; Saranjame, S.

JOURNAL NAME:

Conference: 2025 IEEE Space, Aerospace and Defence Conference (SPACE)

DETAILS:

Published on September 2025

ABSTRACT:

The paper focuses on the design and optimization of an antenna system for a CanSat, emphasizing the importance of reliable communication between the CanSat and the ground station, particularly for the CanSat India Student competition. It discusses the selection of the XBee S2C Pro communication device, which operates at 2.4 GHz and has a theoretical range of 3200 m, highlighting its performance and reliability. The design process involved using materials like aluminum and wooden structures, with a transition to measuring tape for better reliability in connections. The antenna was simulated using MATLAB and ANSYS HFSS, indicating a focus on achieving optimal impedance matching for efficient signal transmission.

Link: https://doi.org/10.1109/SPACE65882.2025.11171358

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Numerical Investigation Of Mixing Enhancement Studies In A Circular Scramjet Combustor

AUTHOR :

Gangani, S.; Bagga, S.; Nagi, G.S.; Thorat, S.; Sahoo, D.; Bajaj, D.K.

JOURNAL NAME:

International Journal of Energy for a Clean Environment (Vol.-26,Isssue-7)

DETAILS:

Published on 24 April 2025

ABSTRACT:

Cavity-assisted scramjets are the most promising propulsion solution for air-breathing hypersonic vehicles. The present investigation is focused on analyzing the effect of cavity-based injection in a supersonic circular (axisymmetric) combustor using the commercially available software ANSYS-Fluent. Species transport equations have been implemented with a 3D Reynolds-Averaged Navier-Stokes (RANS) equation and the k shear-stress transport (SST) turbulence model for the flow analysis. The performance of the injection method is evaluated by analyzing characteristics such as combustion efficiency, wall static pressures, and stagnation losses within the combustor. The numerical simulations are performed with various fuel injection pressures and equivalent ratios while keeping the injection angle fixed. The species transport model, which only considers a few particular species, uses the finite rate reaction model. This model considers species that enter the combustor at an Inlet Mach number 1.8. It has been observed that there is a significant difference in the pressure loss among the different injection schemes. A comparison of different injection pressures shows that the highest injection pressure results in lower static pressure loss and higher temperature distribution across the combustor's length. The maximum combustion efficiency is achieved within the combustor length.

Link:
https://doi.org/10.1615/InterJEnerCleanEnv.2025057306

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Sweet spots in coal bed methane (CBM): Major controlling parameters identification through reservoir modeling, simulation, and uncertainty analysis to De-risk field development

AUTHOR :

Parida, B.P.; Sinharay, R.
.

JOURNAL NAME:

Journal of Natural Gas Geoscience

DETAILS:

Published on October 2025

ABSTRACT:

Sweet spots refer to specific areas within a reservoir where the parameters are optimal for achieving maximum production while minimizing the required footprint and investment. The high complexity of reservoirs, often compounded by absent or insufficient seismic data and the requirement of many wells, poses significant challenges. Hence, it is crucial to identify the sweet spot during the exploration stage for the optimized assessment of a coal bed methane (CBM) field. Identifying major controlling parameters that impact production is the first and foremost step toward demarcating the sweet spot. The present study uniquely presents an integrated workflow combining all aspects of subsurface processes i.e. reservoir characterization, modeling, and numerical simulation with sensitivity analysis. This workflow has been used along with both short- and long-term uncertainty analysis, which adds considerable value to the existing knowledge. The analysis shows that Gas content, Permeability, thickness, and gas saturation are the dominant parameters for sweet spot demarcation. However, other parameters like bottom-hole pressure constraint and relative permeabilities also impact production, especially during early production periods. It is interesting to note that the order of impacting parameters changes from long-term to short-term. In the long term, thickness and gas content, i.e., resources, play a more significant role than saturation, permeability, or relative permeability. However, in the short term, which is vital for the economic success of the field, permeability, saturation, and relative permeability play a more critical role. This practical insight helped identify sweet spots in this coal reservoir by shortlisting the areas where these dominant controlling parameters coexist and are well developed. Further, sweet spots were used to plan appraisal or pilot production test wells whose success ultimately led to field-scale development. The average production trends of producing wells in both sweet spot and moderate areas are used to validate these findings. This workflow can be applied in other reservoirs or basins, which will help CBM exploitation time and cost-effectiveness and optimize field development.

Link: https://doi.org/10.1016/j.jngge.2025.09.002

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Potato and Tomato Crop Disease Prediction Using Advanced Machine Learning Techniques

AUTHOR :

Rajderkar, S.; Sawant, H.; Baraskar, T.

JOURNAL NAME:

2025 International Conference on Advancements in Smart, Secure and Intelligent Computing (ASSIC)

DETAILS:

Published on 2025

ABSTRACT:

Agriculture is important for global food security, yet crop diseases continue to damage and reduce yields. Diseases in potato and tomato plants present serious challenges to farmers as timely detection and management is required. This research showcases a comparative study of three machine learning models, Convolutional Neural Networks, Support Vector Machine and Random Forest Classifier. The methodology involves preprocessing images taken from Plant Village dataset with Contrast Limited Adaptive Histogram Equalization (CLAHE) to improve image quality, followed by comparative study of classification approaches. Although CNNs obtain better accuracy by automatically drawing features, SVM and Random Forest classifiers give an overview of how traditional machine learning algorithms work. The findings explain the pros and cons of these methods and therefore outline a complete solution for an efficient and scalable crop disease detection system.

Link:
https://doi.ieeecomputersociety.org/10.1109/ASSIC64892.2025.11158703

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Building Resilient Cryptocurrency Ecosystems: Lessons from Cyberattacks and the Role of Blockchain and AI

AUTHOR :

Bhandari, R.B.; Ramteke, N.; Kankariya, R.; Salunkhe, H.A.; Raidas, A.; Lohar, A.

JOURNAL NAME:

Learning and Analytics in Intelligent Systems (Vol.-**56**)

DETAILS:

Published on October 2025

ABSTRACT:

As the crypto world blossomed into a fantastic financial jump, so did the homing in on hacker attacks against exchanges and digital wallets. If from early penetrations, for example, the breakdown of mt. Gox in 2014 to high-profile demonstrated shows (Wazir, Traveler Expansion, and HTX hacks); these occasions mirror the fundamental weaknesses in the cryptocurrency currency environment. Hackers took an astounding $1.7 billion in cryptocurrency from platforms through 2023, with 60 of those attacks attributed to groups from North Korea that might help finance nuclear weapons programs [1]. The vulnerabilities these cybercriminals exploited from ransomware and DeFi to targeted digital currency thefts highlighted the need for more robust security measures across crypto verticals. 83% of financial industry leaders have elevated cybersecurity to a priority with significant repercussions to their business [2]. There has been a new pattern-bursting for new technologies like blockchain and artificial intelligence (AI) that are highly beneficial for advertising the crypto ecosystem. The decentralized structure of blockchain, its immutable records, and transparency ensure robust data integrity. At the same time, AI-powered solutions like anomaly detection and predictive analytics are equipping organizations with sustainable actions to thwart evolving threats. AI-driven cybersecurity reduced the average data breach cost from $4.45 million to $2.65 million in 2023, saving businesses an average of $1.8 million [3]. The study proposes concrete steps to strengthen cryptocurrency platforms against future threats by learning from past cyberattacks. It is crucial to work with governments, industry stakeholders, and technological innovators to collaboratively create digital environments that are secure & transparent. This research work around incorporating blockchain and AI to foster robust cryptocurrency system.

Link: https://doi.org/10.1007/978-3-032-05373-2_17

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Optimizing Engineering Student Guidance: An NLP Approach

AUTHOR :

Agrawal, R.; Dholwani, D.; Patil, A.; Pandey, V.A.; Ahmad, S.; Magarde, S.

JOURNAL NAME:

2025 International Conference on Advancements in Smart, Secure and Intelligent Computing (ASSIC)

DETAILS:

Published on 2025

ABSTRACT:

This research discusses creating an interactive guidance chatbot using natural language processing (NLP), specifically TF-IDF, with TensorFlow. The chatbot is developed on a rich dataset of topics in engineering as well as on queries by the students and obtained an impressive 98.63 % accuracy rate in generating personal, context-sensitive responses. The chatbot shows much promise in supporting student queries by identifying them, being able to offer precise guidance to the students, and thereby offloading faculty workload. Such a chatbot fosters student engagement and active learning, thus putting into evidence the transformative aspect of AI for education. The paper reflects possibilities for further research in the future: advanced NLP, multimodal interactions, and integration with an educational platform. In all, this is a first step towards creating tools driven by AI toward personalized learning experiences, a preview of what could come in time to mean efficient and student-focused educational support.

Link:
https://doi.ieeecomputersociety.org/10.1109/ASSIC64892.2025.11157986

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

LC-MS/MS-based discovery of new cytochalasin from fungus Rosellinia sanctae-cruciana

AUTHOR :

Sharma, N.; Choudhary, P.; Kumari, P.; Murtaza, M.; Abrol, V.; Kumar, C.; Singh, R.; Jaglan, S.; Kushwaha, M.

JOURNAL NAME:

Natural Product Research

DETAILS:

Published on 9 September 2025

ABSTRACT:

The ethyl acetate extract of the fungus Rosellinia sanctae-cruciana was analysed using LC-MS/MS, revealing a peak at m/z 558.272 [M + H]+ with the molecular formula C30H39NO9, indicative of the cytochalasin class. The isolated compound, 18 Da higher in molecular weight than 19,20-Epoxycytochalasin-N, featured an opened diol structure at positions 5 and 6. Named Cytochalasin-Augusta, it was purified using HPLC and characterised by 1H NMR,13C NMR, HSQC, HMBC, and NOESY spectroscopy.

Link: https://doi.org/10.1080/14786419.2025.2565279

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Social Threat Identification On X Via Sentiment Analysis: An Svm And Lstm-Based Approach

AUTHOR :

Pawar, R.G.; Chinchmalatpure, P.; Chinchmalatpure, S.; Pujeri, R.V.; Wategaonkar, D.; Jadhav, N.; Kapare, S.; Naik, D.N.

JOURNAL NAME:

International Journal of Applied Mathematics (Vol.-38, Issue-3S)

DETAILS:

Published on September 2025

ABSTRACT:

This research explores the use of tweet sentiment analysis for threat detection and identification based on X data. X provides a valuable platform for monitoring public sentiment and identifying potential dangers in real time. By categorizing tweets as positive, negative, or neutral, analysts can gain insights into public opinion and identify potential risks related to specific events or topics. The research reviews prior work on using Tweet sentiment analysis for threat detection, highlighting the advantages, challenges, and limitations. It identifies research gaps in the field and proposes a comprehensive approach that combines sentiment analysis techniques with real-time data gathering to identify and mitigate threats with minimal delay.

Link: https://doi.org/10.12732/ijam.v38i3s.167

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Exit interview: a tool for employee retention

AUTHOR :

Tharkude, D.; Dixit, A.; Alexander, J.

JOURNAL NAME:

International Journal of Business Information Systems (Vol.-50, Issue-2)

DETAILS:

Published on 25 September 2025

ABSTRACT:

The study aims to understand the current process of exit interviews carried out by the organisation and identify any deficiencies in the process. The study also aims at identifying more effective ways to conduct exit interviews for their proper impact and utility. The systematic review of literature highlighted how to make exit interviews more effective. Further, the efficiency of the process can be improved with the help of multiple tools/techniques. Since the scope of the study is limited to the state of Maharashtra. The findings of the study apply only to that area. The framework of the review of literature and results provide insights into the professionals about flaws in the existing exit interview process and ways to make it practical for its successful implementation in the current business context and provide insights into current trends and future research directions.

Link: https://doi.org/10.1504/IJBIS.2025.148791

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Influence of cooling mediums on mechanical and tribological characteristics of Al/Cu-based composites reinforced with chromium particles

AUTHOR :

Kumar, P.; Srivastava, V.K.; Sharma, A.

JOURNAL NAME:

Tribology and Materials (Vol.-4, Issue-3)

DETAILS:

Published on June 2025

ABSTRACT:

The intensity of radial heat flux during quenching affects the microstructural features of materials. The interface strength is also affected by the radial heat flux in the case of metal matrix composites (MMCs). Thus, the mechanical and tribological behaviour of MMCs may vary with the quenching medium. The present investigation deals with the effect of the quenching medium on the mechanical and tribological behaviour of chromium (Cr) particles reinforced Al/Cu dual matrix composites. Normal load (viz. 20, 40 and 60 N) and weight percentage of Cr reinforcement (viz. 1, 2, 3, 5, 8 and 10 wt. %) were also varied. The powder metallurgy route was followed for the fabrication of composites. The sintered composites were normalised and quenched in oil and water. The results revealed that water-quenched composites exhibited the highest hardness and compressive strength and the lowest wear. The highest compressive strength was approximately 48 MPa for 3 wt. % Cr reinforced water-quenched composites. The coefficient of friction decreased with an increase in Cr content, whereas it was very difficult to generalise the wear behaviour with respect to Cr content. The fractured and worn surfaces were analysed under a scanning electron microscope to know the fracture characteristics and dominant wear mechanisms, respectively.

Link: https://doi.org/10.46793/tribomat.2025.016

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Converting Human Text into Database Queries Using Natural Language Processing: A Hybrid Approach with Multinomial Logistic Regression and T5

AUTHOR :

Aphale, A.; Chavan, S.; Jadhav, N.; Balsurkar, P.; Mali, P.; Bhagat, D.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

This research introduces a novel system for converting natural language text into structured SQL queries using a hybrid [22] [23] Natural Language Processing (NLP) framework. The system integrates a frontend interface for user input, a Logistic Regression model for query classification, and a T5 Transformer for SQL generation, executed on a relational database. Evaluated on a dataset of 2000 diverse natural language queries, the system achieves 92% accuracy in query classification and 88% in SQL generation, outperforming a rule-based baseline. This work addresses the challenge of enabling non-technical users to interact with databases seamlessly, with applications in data analytics, business automation, and education. Limitations, such as handling multi-table queries and ambiguous inputs, are analyzed, and future enhancements are proposed, including multi-language support and deep learning optimization.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156919

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

AI-Powered Waste Management: Real-Time Garbage Detection and Categorization

AUTHOR :

Gore, A.; Bishoi, A.; Kute, R.S.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

The increase in trash production has made garbage collection in urban areas an important concern. Improper disposal results in degradation, health risks, and missed resource recovery opportunities. Metropolitan cities are finding it difficult to manage the classify waste in order to further process it. New technologies, like deep learning and image processing methods, have been created to solve this problem. The important issue of ineffective urban waste management and its effects on the environment is addressed in this study. By building an AI-powered waste classification system, we hope to enhance recycling practices and support environmentally friendly waste management that can be used in a range of contexts. In this work, we present an automated garbage classification system that recognises and categorises trash in real-time using machine learning and computer vision techniques. The system applies a deep learning model to classify the trash into several categories in addition to an image processing pipeline that pre-processes incoming photos and extracts pertinent information. Different waste categories, such as recyclables, organic waste, and nonrecyclables, can be identified and categorized by the system. This paper presents a YOLOv8-based object detection pipeline optimized with TensorFlow Lite for real-time waste sorting on edge devices. The system classifies items into six categories (biodegradable, cardboard, plastic, paper, metal, glass) at ~30 FPS. In experiments on a 10K-image dataset, it achieves ≈0.48 mAP@0.5 (high accuracy on glass/metal), demonstrating effective automated recycling.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156908

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Design and Performance Analysis of Lightweight ECC-Based Authentication Protocol for Low-Power IoT Applications

AUTHOR :

Purohit, N.; Joshi, S.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

As the Internet of Things (IoT) grows quickly, it's important to make sure that security measures are strong but not overly intrusive, especially in places with limited resources. Elliptic Curve Cryptography (ECC) has become popular because it has strong security and small key sizes that make it perfect for IoT apps that need to use little power. The main goal is to provide strong protection with as little energy use and computing complexity as possible. The suggested protocol includes a customizable ECC system that works best with IoT devices and uses curves like SECP256R, SECP384R, SECP521R, SECT283K, and BrainpoolP512R. Performance assessment focuses on critical parameters including computational cost, memory utilization, energy consumption, authentication latency, and communication overhead. Experiments show that the suggested ECC-based identification makes system processes much easier and saves a lot of energy, showing that it can be used in real-world low-power IoT deployments. The results of the study are very helpful for creating ECC identification methods for IoT settings that are safe, scalable, and energy-efficient. This improvement successfully fixes the speed and security issues with current IoT identification methods, making them more widely used and providing better security for many IoT apps.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156885

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A Review of Unsupervised Learning Based Anomaly Detection in Traffic Videos

AUTHOR :

Buchade, S.; Sakarkar, G.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

Anomaly detection in traffic surveillance videos is essential for enhancing road safety and traffic management. This review examines studies that employ unsupervised learning techniques for anomaly detection (AD) in traffic videos. The techniques include Autoencoders (AE), Generative Adversarial Networks (GAN) which are categorized as reconstruction-based methods and Clustering based methods. We categorize anomalies based on different characteristics, discuss benchmark datasets commonly used in unsupervised learning, and evaluate key performance metrics. Additionally, we explore real-world applications of unsupervised AD, highlight existing challenges, and outline potential future directions for advancing this field. This comprehensive review provides insights into the progress and limitations of unsupervised learning approaches for traffic anomaly detection.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156587

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Implementation of Secure and Scalable Over-the-Air Firmware Updates for STM32F407VG with Quectel M66 and Cloud Integration

AUTHOR :

Sangrulkar, O.; Motade, S.; Gunale, K.; Deshpande, A.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

A wireless system to update software on STM32F407VG microcontrollers using Quectel M66 modules and the cloud was devised. The primary objective was to make updating software straightforward, automatic and safe as well as connecting these chips into a network that can scale up without complexity. Given that many devices are being manufactured with such chips, it is thus very important to have an easy way of getting them updated. We designed it for immediate satisfaction and future preparation when more appliances will have microcontrollers built in them. Through our work, we demonstrated how this system facilitates faster and better software updates without the need for physical presence or specialized tools. It finds great usefulness in various instances by allowing effortless maintenance of hardware using lesser resources thus demonstrating how cloud connections could be involved in making microcontroller software safer than ever before even while the use of these intelligent chips expands in all kinds of devices.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156359

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Intelligent Automatic Number Plate Detection System Using TensorFlow, Firebase & Real-Time Android Integration

AUTHOR :

Mantri, S.; Kumar, N.; Dholwani, D.; Pal, M.; Jain, H.; Dhote, M.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

Automatic Number Plate Detection (ANPD) plays a crucial role in various applications, including traffic management, law enforcement, and security systems. Existing ANPD systems often face challenges related to accuracy in diverse conditions, real-time processing capabilities, and seamless accessibility. This research paper presents the development of an intelligent ANPD system using TensorFlow, integrated with Firebase for report generation and an Android app for real-time accessibility. The proposed model leverages the power of TensorFlow's deep learning capabilities to perfectly detect and recognize number plates, images and video streams. Firebase provides a robust backend for storing and managing the detected number plates, generating reports, and enabling real-time updates. The Android app allows users to access the system remotely, view detected number plates, and receive notifications. The system is evaluated on a diverse dataset of images and videos, demonstrating its effectiveness and efficiency in real-world scenarios. This integrated approach addresses the limitations of traditional ANPD systems by providing high accuracy, real-time processing, and convenient accessibility through a mobile platform. Further, the paper explores the potential of this system for integration with other smart city applications and its contribution to enhancing traffic management and security.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156257

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Automatic Emergency Acceleration System

AUTHOR :

Khedkar, N.; Patil, A.; Kumar, M.; Kute, R.S.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

Rear-end collisions comprise 21.4% of traffic accidents in India, exposing limits in traditional ADAS responses. This paper proposes an Automatic Emergency Acceleration System (AEAS) that augments ADAS by triggering controlled forward or lateral acceleration to escape the impact zone when Time-to-Collision (TTC) < 1.5 s (rear-end) or 2.0 s (angular threats). Tested on a scaled prototype with the D2 City dataset from SCI Databank, AEAS demonstrated a 27% improvement in collision-avoidance rates compared to AEB. This reflects a significant enhancement, offering an active alternative to conventional braking-based strategies.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156291

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A Peer-to-Peer Decentralized Smart Energy Grid

AUTHOR :

Patel, A.; Sharma, S.; Siddique, Z.; Mahajani, P.S.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

This article proposes a completely integrated decentralized energy trading system using a peer-to-peer (P2P) architecture with embedded IoT devices, real-time communication, and blockchain-based transaction validation. The proposed system makes use of ESP8266 microcontrollers, INA219 sensors, and solar-powered storage using lithium-ion batteries to enable energy sharing between smart nodes in a local microgrid. A robust backend architecture, developed using Node.js and Express.js, enables real-time data sharing using WebSocket protocols. The frontend, developed using ReactJS and Tailwind CSS, provides a responsive and dynamic user interface to track transfer progress and control device operations. All energy transactions are secured and logged through smart contracts run on a private Ethereum network via the Ethers.js library. The backend also connects blockchain operations and device state synchronization through a scalable WebSocket gateway layer. Publish-subscribe models in real-time are utilized for frontend notifications. Safety features such as low-voltage cutoff and energy monitoring provide reliable energy trades. The suggested framework demonstrates a viable method for scalable, secure, and interactive energy sharing in decentralized smart grids.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156685

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TITLE:

Osteoporosis Detection Using Deep Learning

AUTHOR :

Bhagat, D.; Raut, U.; Baviskar, D.; Satpute, S.; Wase, K.; Salunkhe, R.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2024

ABSTRACT:

In this study, we proposed a new framework for early diagnosis of osteoporosis based on the deep learning architectures applicable to biomedical imaging. Using a large dataset and two modern neural net architecture (VGG and YOLO), we strive to further improve diagnosis and how fast timely interventions could be performed. The VGG model, known for its deep convolutional layers, achieved a remarkable 97.5 accuracy in capturing complex image features for detailed analysis, making it an excellent tool for medical diagnostics. Meanwhile, the YOLO model, renowned for realtime object detection, demonstrated a commendable 93.5 accuracy, making it suitable for rapid screening applications. Our methodology included meticulous model validation and refinement to ensure diagnostic reliability, and we propose strategies for integrating these neural networks into clinical workflows, promising to revolutionize osteoporosis screening and diagnosis. This thesis explores the technical aspects of dataset preparation, model training, and validation, while also discussing the broader implications of adapting deep learning models for widespread clinical use to improve bone health outcomes.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156280

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Intelligent Prescription Interpretation and Symptom-Based Diagnosis Using OCR and NLP in Personalized Healthcare Systems

AUTHOR :

Patel, D.; Viju, R.; Sayeed, A.; Shinde, S.; Bhagat, D.; Aphale, A.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

This paper presents a personalized healthcare pipeline that integrates OCR and NLP to extract medicine names from handwritten prescriptions, retrieve drug safety information, and predict diseases based on user-reported symptoms. Unlike prior approaches that focus solely on text recognition or symptom analysis, this system unifies both tasks into a coherent framework. It extends beyond basic OCR by matching extracted medicine names with a structured dataset and retrieving drug precautions via the RxNorm API. Although the RxNorm integration currently faces mapping challenges, it highlights the potential for incorporating drug safety checks into real-time systems. A rule-based engine predicts possible diseases based on symptoms using a structured CSV file. Preliminary evaluations demonstrate promising utility, laying the foundation for intelligent and scalable telemedicine systems.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156277

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

AI-Powered Virtual Try-On: Enhancing Online Shopping with Real-Time Technology

AUTHOR :

Bhagat, D.; Jadhav, R.; Borole, L.; Sadigale, P.; Bijapure, A.; Deshmukh, A.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

The research aims AI-controlled Virtual Dressing Room technology that enhances online shopping by using camera vision alongside ML technology and AR capabilities. A camera enables the system to capture real-time images before the ML software performs gender detection and background separation to precisely position virtual apparel on the observed body segments. When the system detects a user's gender it presents customized outfit recommendation choices through which users can select products that the system renders specifically for their physical figure. The system applies streamlit for design of an interactive interface while using AI and ML models to process images. This research explores how adding AR technology helps build a virtual try-on experience to create an interactive shopping platform for electronic fashion retail advancement. The research aims to improve virtual shopping simulation utilities because researchers aim to connect offline and online purchasing by making returns more efficient while building consumer satisfaction in order to drive electronic fashion retail expansion into future markets. Deep learning methodologies enable experimental assessments to segment human figures and transfer their bodies for real-time visual displays which boosts operational scalability in virtual fashion platforms.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156251

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TITLE:

Deep Learning Approach for Image Captioning

AUTHOR :

Pagire, V.; Kale, A.; Chavali, M.

JOURNAL NAME:

International Conference on Emerging Trends in Engineering and Technology, ICETET

DETAILS:

Published on 16 September 2025

ABSTRACT:

Automatic image captioning is the process of generating textual descriptions or captions for images based on their content. It represents a machine learning challenge that integrates computer vision (for understanding image content) and natural language processing (for generating text). This field is relatively new and rapidly growing, with ongoing research introducing innovative techniques to improve results. However, significant progress is still needed to achieve outcomes that match human-level performance. In this paper, the proposed method LSTM-GAN is implemented for image captioning. The dataset used for the work is MS COCO. The performance of the proposed method is evaluated by calculating the BLEU (Bilingual Evaluation Understudy) score. The BLEU score value is between 0.6 to 0.7 which shows good results.

Link:
https://doi.org/10.1109/ICETETSIP64213.2025.11156275

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Deep Learning for Exoplanet Exploration: Detecting New Worlds and Evaluating Habitability

AUTHOR :

Kinger, S.; Umbrani, K.; Dsouza, M.; Nehete, A.; Shah, D.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.-1234)

DETAILS:

Published on 21 August 2025

ABSTRACT:

Recent astrophysical advancements highlight the challenges in exploring exoplanets, primarily detected through starlight variations. While the Kepler space telescope aimed to identify Earth-like exoplanets around sun-like stars, manual analysis of light curves remains time-intensive. Thus, efficient detection methods are crucial. Leveraging machine learning and deep neural networks, particularly artificial neural networks (ANNs), shows promise for exoplanet detection by discerning intricate data patterns, notably in light curves. Integration of the NASA Exoplanet Archive Dataset with these techniques allows for assessing exoplanet habitability. This approach enhances researchers' abilities to detect and characterize exoplanets, broadening the quest for habitable worlds beyond our solar system. The study's innovation lies in merging machine learning and deep neural networks with extensive datasets, particularly the NASA Exoplanet Archive Dataset, to improve exoplanet detection and characterization. It investigates the potential of ANNs in identifying exoplanets and predicting their habitability, offering unprecedented insights into discovering habitable planets beyond our solar system. Notably, using ANNs achieved 88.3% accuracy in exoplanet detection on test data, while gradient boosting yielded 91.06% accuracy in habitability prediction.

Link: https://link.springer.com/chapter/10.1007/978-981-96-2329-7_13

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Economic Dependency Ratio as a Dimension of Poverty and Vulnerability

AUTHOR :

Deo, S.; Sane, A.; Sharma, S.; Tabar, S.

JOURNAL NAME:

Understanding the Multi-Dimensional Nature of Poverty (Book Chapter)

DETAILS:

Published on 2024

ABSTRACT:

The first Sustainable Development Goal (SDG), which is to be attained by the year 2030, is to 'End poverty in all its forms everywhere'.1 However, the progress made in reducing poverty has been reversed due to the spread of the COVID-19 pandemic. The worsening poverty, inequality and vulnerability call for identifying the acuteness of the problem with the help of dimensions like the economic dependency ratio along with other sources like poverty line, access to social security, health care, basic services, food security and asset ownership and social networks at the village to name a few. The economic dependency ratio goes beyond the age dependency ratio and tries to capture the dependency better by incorporating the number of dependants and employed ones in the calculation. In this study, an attempt has been made to highlight the importance of the economic dependency ratio to measure vulnerability better in India. Unemployment data provided by the Centre for Monitoring Indian Economy (CMIE) has been utilised to understand the severity of dependency at the country level. Primary data has been collected with the help of the Proportionate Stratified Sampling method from 600 notified, non-notified slum households staying in the western part of India and in-depth interviews have been conducted with a few homeless families. Quantitative data has been analysed using SPSS and Stata software.

This study will be immensely useful as it aims to improvise the methodology to identify the poor and vulnerable. Better identification can take us a step closer to achieving SDG 1.

Link: https://doi.org/10.1108/978-1-83753-292-620241006

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Revisiting Microfinance as an Instrument of Sustainable Development

AUTHOR :

Sengupta, R.; Patil, A.; Lone, S.

JOURNAL NAME:

Creating Pathways for Prosperity (Book Chapter)

DETAILS:

Published on November 2024

ABSTRACT:

Today, financial viability and the creation of social value form the main axis for the operation of inclusive firms. However, depending on who offers the ideas for inclusive enterprises, there can be questionable presumptions regarding what is promised in relation to poverty. One dubious premise is that all poverty can be solved by the market. Markets may be a prerequisite but not sufficient condition for resolving social problems. Financial inclusion through microfinance is a crucial facet of social inclusion. At the World Summit for Social Development (WSSD) in March 1995, governments made a commitment to eradicate poverty on a global scale, citing it as a moral, social, political and economic imperative. One of the three main objectives of the WSSD was the eradication of poverty. Microfinance provides financial services for persons living below the poverty line and for small businesses that lack access to traditional banking services and related products. Microcredit is the lending of small amounts of money to underserved consumers. Microfinance succeeded where institutional financing failed, but its viability is in question. An all-encompassing approach is required to support the growth of the new microfinance sector and manage the balance that must be struck between outreach and sustainability. It is well known that only efficient institutions can greatly lower the long-term expense of serving irregular and low revenues.

Link: https://doi.org/10.1108/978-1-83549-121-820241006

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TITLE:

Development Of Art Integrated Program And Its Effectiveness Among Students In Pune City

AUTHOR :

Shamal, R.; Sakhare, S.J.

JOURNAL NAME:

MSW Management (Vol.-34, issue-2)

DETAILS:

Published on December 2024

ABSTRACT:

The current research work concerned with study on development of Art Integrated Program and its effectiveness among school students in Pune city. Art Integrated has it's important for the students for present their basic knowledge of the content. The concept of 'Art Integrated' education is a teaching approach that incorporates various forms of art into the learning process. The main goal of the Art Integrated is to enhance understanding and engagement across different subjects by integrating artistic elements such as visual arts, music, dance, drama, and creative writing. The main approach can make learning more dynamic and engaging by linking academic content with creative expression for better understanding.

Students need to understand the concepts, applications of knowledge gained through art integration at the school age in accordance with subject content. Art Integrated Education (AIE) plays a crucial role in enhancing the overall learning experience and developing various skills in students. The present research paper focused on to study on the development of Art Integrated Program and its effectiveness among school students in Pune city, with prime objectives are- i) To study the present status of Art Integrated Education of VII std. Students. ii) To develop the Art Integrated Program for VII std. Mathematics subject. iii) To define the effectiveness of Art Integrated Program for VII std. Mathematics subject.

Research methodology is a different type involving a conversations, interpretative way, and observations and studies the secondary sources- like books, articles, journals, research works, expert opinions, and internet source, etc.

Link:
https://mswmanagementj.com/index.php/home/article/view/260

Published on October 2025

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