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TECHNOLOGY, RESEARCH, SOCIAL INNOVATION & PARTNERSHIPS

FACULTY PUBLICATION

RESEARCH PAPERS

April-2026

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TITLE:

Deep Learning-Based Learning Path Recommendation System for Personalized Education

AUTHOR :

Shaikh M.; Purushothaman R.; Khatoon S.; Subasree R.; Raj H.; Amalanathan S.M.

JOURNAL NAME:

Proceedings of 2025 10th International Conference on Science Technology, Engineering and Mathematics, ICONSTEM 2025

DETAILS:

Published on November 2025

ABSTRACT:

In recent years, there is not lacking the attention about the notion of personalized learning that facilitates the search of adaptive educational systems that are able to optimize the match between learning teaching materials and the needs and preferences of each learner. Convex deep learning based context aware recommender location as powerful collection to this regard has come into light by rebuilding data driven to learning paths generation. This paper proposes a Deep Learning Based Learning Path Recommendation System to utilize the latest neural architecture for intelligent sequencing of curricula by representing the behaviors of learner, difficulty levels of contents and level of engagement of each learner. Unlike the rule-based or collaborative filtering ways based on the Web, the proposed system uses the Bidirectional Long-Stand Memory (Bi-LSTM) actual function with PyTorch-designed framework to capture the data from the highlight of the passage of time for learners interaction, and let the overall system guess the most appropriate plan learning activity for the continuation of studying the courses of research. Experimental results accordingly result in demonstrating the higher accuracy and promiscuity as compared to the conventional recommendation systems, which is a positive trend to intelligent and learner-centered education.

Link:
https://doi.org/10.1109/ICONSTEM65670.2025.11374297

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TITLE:

A Multi-XAI Powered Framework for Customer Churn Prediction Using Ensemble Learning and Reinforcement-Based Model Adaptation

AUTHOR :

Singh A.; Badwal G.K.; James N.M.

JOURNAL NAME:

2025 International Conference on Computing and Communications, COMPUTINGCON 2025

DETAILS:

Published on September 2025

ABSTRACT:

In view of the increasing competition in the commercial sector, customer churn is a significant risk hence churn prediction has become important for maximizing customer retention and revenue generation. Traditional models for churn prioritize predictive accuracy but do not provide sufficient transparency and adaptability to behavioral deviations. This paper presents a hybrid framework that uses Ensemble Learning integrated with Explainable AI (XAI) and Reinforcement Learning to provide an interpretable, accurate and reliable churn prediction model. A LightGBM classifier was trained on an e-commerce dataset containing customer churn data based on behavioral features, achieving an accuracy of 98.76 % for churn prediction and 69.63 % for rewards recommendation for customer retention. To enable interpretability, SHAP and LIME are used to provide local and global explanations for predictions contributing to the model's transparency and decision. To monitor the systems misclassifications a Q-learning based Reinforcement Learning agent was employed which upon reaching a maximum threshold of number of misclassifications retrained the model and adjusted the rewards recommendation. The integrated pipeline shows reliable churn detection along with explainability and policy adaptation making it suitable for growing businesses to take actionable and timely retention strategies, reducing customer retention leading to overall benefit of the business.

Link:
https://doi.org/10.1109/COMPUTINGCON64838.2025.11377974

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Novel Approach towards Speaker Identification in Meetings

AUTHOR :

Apte A.; Atgur V.; Beniwal P.; Flora S.; Sonawani S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

Effective documentation and script recording of official proceedings, meetings and conferences is essential for decision-making. But manually recording who says what can be time-consuming and prone to mistakes. In order to automate the process of identifying speakers during meetings, we propose in this paper a speaker identification system that makes use of deep learning techniques. Our system extracts features from audio recordings using Mel-frequency cepstral coefficients (MFCCs) and Long Short-Term Memory (LSTM) networks. We validate and experiment a great deal to show that our method works well for reliably identifying speakers in real-time scenarios. This study helps to improve efficiency and accuracy in recording and analyzing meeting content by streamlining the formal meeting documentation process.

Link:
https://www.scopus.com/pages/publications/105034217653

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TITLE:

Green Tribology and Sustainable Development: An Industrial Point of View

AUTHOR :

Kumar P.; Kumar H.; Prasad R.; Khajuria G.

JOURNAL NAME:

Green Tribology and Industry 4.0: Fundamentals and Sustainable Advancements

DETAILS:

Published on 2026

ABSTRACT:

Despite significant advancement in the field of tribology, the concept of green tribology is still in its infancy stage. The concept of green tribology was introduced in-line with the sustainable development. Instead of just designing systems for wear reduction, controlling friction and improving lubrication, the sustainable approach in tribology also includes emission and waste reduction, saving energy and materials, and development of novel green materials and lubricants, which can minimize the harmful effects of technical systems on the environment. Thus, considerable approaches should be adopted for technical systems of industries, which undertake the principles of green tribology. This chapter discusses some such green tribology considerations in industries. Various aspects of green tribology in industries are discussed, including biodegradable lubrication, friction and wear reduction in machineries, real-time monitoring of tribological systems for their efficient design, effect of industrial tribological materials on the environment, and many more. The approximate underlying mechanisms are also discussed, which can be contemplated to design industrial tribological systems for sustainable development.

Link:
https://www.scopus.com/pages/publications/105035563701

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

The Impact of Social Media on Pharmaceutical Marketing: A Study of Indian Youth

AUTHOR :

Nandurkar P.; Deshmukh S.B.; Chandwaskar P.; Gupta P.

JOURNAL NAME:

International Journal of Drug Delivery Technology (Vol.-16, Issue-3)

DETAILS:

Published on March 2026

ABSTRACT:

This paper discussed what pharmaceutical marketing using social media does to the Indian youths, and how the psychological mechanisms responsible affect the intention to purchase. As a quantitative cross-sectional research design, primary data were collected by administering 512 of questionnaires to respondents who were aged 18-30. The relationships between Social Media Exposure, Perceived Credibility, Trust, Attitude toward Pharmaceutical Marketing, and Purchase Intention had been tested using SEM. The results showed that the Social Media Exposure had a lot of effect on Attitude either directly or indirectly via Perceived Credibility and Trust. Attitude turned out to be the most powerful predictor of Purchase Intention meaning that positive perceptions of pharmaceutical marketing content determined the higher behavioural intention. The model has revealed good indices of fit and high levels of explanatory power with 56 percent variation in Purchase Intention. The research revealed the influence aspect of social media that creates the persuasive effect on the minds of the youths when making decisions regarding the pharmaceutical sector. The results established the value of credibility, transparency, and ethical communication in digital pharmaceutical advertising in the Indian environment.

Link:
https://ijddt.com/abstract/16/IJDDT,Vol16,Issue3s,Article98.html

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Deep Learning based Cat Breed Recognition

AUTHOR :

Patil C.H.; Bhoite S.; Patil H.; Jabde M.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on February 2025

ABSTRACT:

This paper contributes to the field of computer vision and cat breed recognition, demonstrating the feasibility of applying machine learning techniques for cat breed classification. The findings of this study have practical implications in the context of animal welfare, pet breeding, and veterinary medicine. Additionally, this Project serves as a valuable foundation for future work in the development of real-world applications and automated tools for cat breed identification. It uses a ResNet50 model, which is a type of convolutional neural network (CNN). CNNs are well-suited for image classification tasks, and ResNet50 is a particularly powerful model that has been shown to achieve state-of-the-art results on many different datasets. The code first loads the ResNet50 model from PyTorch. Then, it creates a dataset of cat images, with each image labeled with its corresponding breed. The data is divided into train and validation set. The model is learning from training set, and the test set is used to check the performance on unseen record.

Link:
https://www.scopus.com/pages/publications/105034112757

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TITLE:

Adoption of Interactive Mobile Learning Technologies through the Lens of the Technology Acceptance Model

AUTHOR :

Kumar A.; Banerjee S.; Arokiasamy A.R.A.; Gupta K.; Bansal S.

JOURNAL NAME:

International Journal of Interactive Mobile Technologies (Vol.-20, Issue-7)

DETAILS:

Published on 10 April 2026

ABSTRACT:

The increasing use of interactive mobile learning technologies has the potential to improve learner flexibility, engagement, and personalization their learning experience. However, the successful implementation and adoption of these technologies directly depend on users' perception and acceptance of the technology. This study aims to examine the adoption of interactive mobile learning technologies through the lens of the technology acceptance model (TAM). The study focuses on understanding the factors that influence behavioral intention (BI) to use the technologies. Data was collected from 51 participants working in the education industry using the convenience sampling method. The study adopted a quantitative survey-based research approach, and a well-structured questionnaire was used to collect data. Statistical techniques were applied to the collected data to examine the relationship between key constructs like perceived usefulness, perceived ease of use (PEOU), behavioral intention, and attitude toward use. The research has revealed the influence of different aspects on the adoption of technology. This study aimed to contribute to the existing literature by empirically using TAM in the context of interactive mobile learning technology. Findings suggest 1) PEOU positively impacts perceived usefulness (PU) of interactive mobile learning technologies, 2) PU has a significant positive effect on attitude toward use (ATU) of interactive mobile learning technologies, and 3) ATU has a significant positive effect on BI to use interactive mobile learning technologies. The findings of the study will assist instructional designers and technology developers in designing user-centric mobile learning solutions. The findings will also support informed decision-making for the effective integration of interactive mobile learning technologies in the traditional educational infrastructure. It will also guide and form the basis for future studies in mobile learning adoption.

Link: https://doi.org/10.3991/ijim.v20i07.61085

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TITLE:

Reliability and Feasibility Assessment of EldenCare: A Geriatric Clinical Decision Support System Pilot Study

AUTHOR :

Syed J.; Chalasani S.H.; Pereira P.; Sharma A.; Patil V.; Ramesh M.; Dayananda M.; Polumuri S.K.; Tank N.B.; Pallavi T.L.; Deepa T.; Ghule G.

JOURNAL NAME:

Hospital Pharmacy

DETAILS:

Published on 3 April 2026

ABSTRACT:

Background: Medication safety is a critical concern in geriatric care, with high rates of polypharmacy and potentially inappropriate medications among older adult patients in India. The EldenCare application was developed as a digital clinical decision support tool to address these challenges through evidence-based screening and collaborative medication management. Objective: To evaluate the reliability and feasibility of the EldenCare system in supporting safe medication practices among older adults. Methods: This prospective observational study was conducted over 10 days with 22 healthcare professionals and 15 simulated patient profiles. Reliability assessment included the validation of automated clinical calculations (creatinine clearance and glomerular filtration rate) and the evaluation of drug-related problem (DRP) detection. Feasibility was measured using the System Usability Scale (SUS), AttrakDiff Mini questionnaire, and Technology Acceptance Model. A companion mobile application was also evaluated by 15 Android users based on 11 key features. Results: The EldenCare system received positive usability ratings (SUS: 72.82 ± 9.83) and high acceptance scores (perceived usefulness: 5.86 ± 0.65; perceived ease of use: 6.02 ± 0.60) from healthcare professionals, with no significant differences between physicians and clinical pharmacists ($P > .05$). However, significant technical limitations were identified: (1) none of the 25 test cases for clinical calculations fell within the acceptable ±2% error margin; (2) DRP detection showed inadequate accuracy across all categories (53.42% overall, range: 61.64% to 76.02%, all below the predetermined 95% threshold); and (3) the patient mobile application's medication and appointment reminder notifications failed after 3 days. Conclusion: EldenCare shows promising potential through high user acceptance but requires substantial technical refinement before clinical implementation.

Link: https://doi.org/10.1177/00185787261426945

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TITLE:

Analyzing the Barriers of Adopting Air Taxis in Emerging Economy Context: A Decision-Making Framework

AUTHOR :

Arshi T.; Agarwal V.; Virmani N.; Saxena G.; Bhandari D.

JOURNAL NAME:

International Journal of Mathematical, Engineering and Management Sciences (Vol.-11, Issue-2)

DETAILS:

Published on 1 April 2026

ABSTRACT:

In today's scenario, air taxis are getting lot of traction due to number of potential advantages. Since the concept is relatively new in the market, and there are various challenges along the path to the adoption of air taxis. Therefore, the study first explored the challenges using the scholarly literature and categorized them according to the Technological, Organizational, Environmental, and Human (TOEH) framework. It shows that urban air mobility (UAM) deployment in India faces several challenges, including unclear regulations and infrastructure, unclear business models, and public reluctance due to safety and cost concerns. After identifying the challenges, the study employed the Interpretive Structural Modelling technique to develop a hierarchical framework of the challenges. Further MICMAC analysis was applied to categorize the challenges into autonomous, linkage, independent, and dependent categories. The results show that most barriers fall under the linkage category, and regulatory and legal ambiguity have the highest driving power. The study results add to the existing literature by establishing a structural relationship among the anticipated barriers. Also, the results will help practitioners develop strategies to overcome the challenges with relative ease.

Link:
https://www.ijmems.in/article_detail.php?vid=11&issue_id=55&article_id=765

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TITLE:

Comprehensive Review on Various Web Technology Tools

AUTHOR :

Chanchlani A.S.; Gune S.H.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

In the fast-paced world of web development, selecting the right tools and frameworks is essential for the success of web applications. A web application is a software program that runs on a web server and is accessed via a web browser over the internet. Web developers today face the challenge of working with ever-evolving technologies, making it crucial to choose the most suitable development tools. This study provides a comprehensive comparative analysis of leading website builders, content management systems, design and prototyping tools, coding environments, and editors. By evaluating these tools based on criteria such as features, ease of use, community support, strengths, and weaknesses, the paper aims to offer developers practical insights for informed decision-making. This research adds to the existing body of knowledge by delivering a thorough comparison, helping developers streamline their workflow and improve the quality of their web applications.

Link:
https://www.scopus.com/pages/publications/105034123410?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A sentiment-driven framework for early detection of emerging business trends through multi-platform social media analytics

AUTHOR :

Baviskar D.; Baraskar T.; Bhalekar M.; Chunawale A.; Halwai H.; Patekar A.; Kachewar A.

JOURNAL NAME:

MethodsX (Vol-16)

DETAILS:

Published on June 2026

ABSTRACT:

Social media sites provide warning signs for shifts in consumer behavior, competitive forces, and emerging market trends. However, most small and medium-sized businesses (SMBs) do not have a systematic and scalable approach to tap into this unstructured data from various sites to extract insights. This paper proposes a trend detection method that leverages automated data extraction with n8n workflows, transformer-based embeddings, hybrid sentiment analysis, BERTopic clustering, and a weighted TrendScore composite score. The proposed approach combines multiple, heterogeneous inputs into a single analytical workflow and offers explainable visual and conversational BI interfaces, which are specifically designed for SMBs. The parameter definitions, scoring rules, and workflow diagrams are carefully detailed to ensure that the approach is fully reproducible. The proposed approach focuses on interpretability, robustness across multiple platforms, and applicability within a resource-constrained business setting. • Reproducible multi-platform social data acquisition using exportable n8n workflows. • Hybrid Transformer-Lexicon sentiment modeling combined with BERTopic clustering. • Quantified TrendScore integrating growth, engagement, sentiment shift, and cross-platform consistency.

Link: https://doi.org/10.1016/j.mex.2026.103874

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Paraxial spin-induced vortex generation in epsilon-near-zero materials

AUTHOR :

Jana A.; Ghosh A.; Guchhait S.; Saripalli R.K.; Chaitanya N.A.; Ghosh N.; Gupta S.D.; Samanta G.K.

JOURNAL NAME:

Applied Physics Letters (Vol.-128, Issue-14)

DETAILS:

Published on 10 April 2026

ABSTRACT:

Spin–orbit interactions (SOI) of light have emerged as a prominent area of research in nanophotonics, whereas epsilon-near-zero (ENZ) materials are gaining attention for their ability to interact with electromagnetic fields peculiarly. Integrating these two, we show that homogeneous ENZ thin films enable efficient spin-to-vortex conversion even under paraxial illumination. Using a generalized angular-spectrum formalism and experimental verification, we demonstrate that circularly polarized light incident on an indium-tin-oxide slab generates a second-order vortex in the cross-circular channel. Moreover, for elliptically deformed Gaussian excitation, the spin-induced vortex undergoes astigmatic splitting into two generic vortices. In contrast, a Bessel–Gaussian annulus with phase asymmetry from a tilted axicon produces a similar vortex splitting accompanied by a spin-dependent rotation of the double-core vortex pattern. These findings, combined with the intrinsic nonlinearity of ENZ materials, highlight their potential as a versatile platform to explore SOI effects across linear and nonlinear regimes.

Link: https://doi.org/10.1063/5.0320720

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TITLE:

CollabSpace: Collaborative and Productive Solution for Corporates

AUTHOR :

Musale V.; Kale S.; Dighe A.; Kaulage A.; Aphale A.; Amune A.

JOURNAL NAME:

2025 IEEE Pune Section International Conference, PuneCon 2025

DETAILS:

Published on December 2025

ABSTRACT:

In today's rapid corporate environment, managing tasks, builds, versions and QS processes is efficient to ensure productivity and smooth project execution. Traditional tools for task management, such as Jira, Asana, and Trello, are extensively fragmented and often do not provide robust integration between the core aspects of the development lifecycle, including build tracking, version control, and quality assurance. This increases overhead, reduces visibility and slows down the project's revolution. Collabspace is developed to remedy these flaws by integrating tasks, build management, version control and QA validation into a single coherent platform. In this article, the motivation behind Collabspace, a development method for platform design, is a comparative analysis with existing tools and the potential for future developments aimed at improving team collaboration, project management and productivity.

Link:
https://doi.org/10.1109/PuneCon67554.2025.11378276

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Blockchain-based decentralized Identity and Access Management for Interoperable Metaverse Ecosystems: A Compliance-Oriented Governance Framework

AUTHOR :

Kumar S.; Sirsikar S.

JOURNAL NAME:

Proceedings - 2025 IEEE 3rd International Symposium on Sustainable Energy, Signal Processing and Cybersecurity, iSSSC 2025

DETAILS:

Published on November 2025

ABSTRACT:

The dawn of the metaverse promises a new era of digital interaction using digital avatars in immersive 3D realm, but its decentralized and interoperable nature requires very significant governance challenges, particularly concerning identity, access and data privacy. Current centralized Identity and Access Management (IAM) systems are not privacy focused and ill-suited for this technological landscape. It is creating a fragmented vista where users lack control over their personal data, biometrics, physical device signatures and platforms which face challenges in complying with varied and changing global regulations. This research addresses the critical need for a robust governance framework by proposing a novel, futuristic and blockchain-based decentralized Identity (DID) solution. This research work outlines a compliance-oriented framework that leverages the immutability and transparency of blockchain to provide users with self-sovereign control over their digital identities across multiple metaverse ecosystems. The main component of our solution focuses on the highly sensitive issue of biometric data of digital avatars in Metaverse and its IAM components. The increased use of VR and AR technologies within the metaverse requires a specialized approach to protect this data. Upon integrating the principles of "Governing Biometric Data in the Metaverse"our framework establishes a layered system for integrating identity, access control and global regulatory requirements. This model ensures that biometric data is not only secured on the blockchain but also handled in a manner consistent with regulations like GDPR, CCPA and other data protection laws. This paper aims to bridge the gap between technological innovation, resistant attacks on digital self and regulatory compliance ensuring a secure, private and trustworthy metaverse for all users on different metaverses.

Link: https://doi.org/10.1109/iSSSC66652.2025.11388850

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Classical, Quantum, and Hybrid Quantum-Classical SVMs for Binary Medical Classification

AUTHOR :

Ranjan D.; Joshi D.

JOURNAL NAME:

Proceedings - 2025 IEEE 3rd International Symposium on Sustainable Energy, Signal Processing and Cybersecurity, iSSSC 2025

DETAILS:

Published on November 2025

ABSTRACT:

This paper presents an empirical comparison of pure quantum, hybrid quantum-classical, and classical support vector machines (SVMs) for binary medical classification on the Breast Cancer Wisconsin dataset. Taking advantage of uniform data preprocessing and feature selection, our hybrid QSVM with quantum kernel mapping coupled with classical optimization achieves accuracy of 98.25% compared with the classical SVM (94.74%) and pure quantum SVM (93.86%). In-depth benchmarking incorporates accuracy, recall, F1-score, and training time, exposing accuracy/computational cost trade-offs. We discuss how dimensionality of features and kernel selection influence model scalability and performance. Albeit constrained to a single dataset and simulation, this work enhances knowledge about hybrid quantum SVM benefits and real-world implications. Future efforts will seek to expand benchmarking to other datasets, include real quantum hardware assessment, and create explanation methods to improve interpretability and clinical usability.

Link: https://doi.org/10.1109/iSSSC66652.2025.11387978

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TITLE:

Response Reduction Factor Of Irregular Rc Buildings With Masonry Infills In The Koyna-Warna Seismic Region

AUTHOR :

Shendkar M.R.; Kontoni D.-P.N.; Singh A.; Mandal S.; Maiti P.R.

JOURNAL NAME:

COMPDYN Proceedings

DETAILS:

Published on June 2025

ABSTRACT:

India has witnessed some of the world's most formidable earthquakes, resulting in substantial loss of life and extensive property damage. A noteworthy example of reservoir-induced seismicity is the Koyna-Warna region of Maharashtra, India. This area remains highly susceptible to seismic events, having recorded over a hundred thousand seismic occurrences since 1963. Among them, the most significant was a magnitude 6.5 (Richter scale) earthquake on December 10th, 1967. Seismic design codes commonly integrate the nonlinear behavior of structures using a response reduction factor (R). This study's core objective is to estimate the actual response reduction factor (R) for existing reinforced concrete (RC) building constructions with masonry infills within the Koyna-Warna region. Furthermore, the study delves into the assessment of additional parameters like ductility and overstrength factor in RC buildings. Seismic performance analysis was conducted through adaptive pushover analysis utilizing the SeismoStruct software. The different irregular RC buildings were selected from the Koyna-Warna region, considering their distinct structural and geometric configurations. The findings expose that the average response reduction factor across diverse structural models exceeds the values prescribed by the Bureau of Indian Standards code. Additionally, masonry infills in bare frames provide a significant contribution to improving the structure's overall performance. Finally, a thorough analysis and comparison of the results with various structural parameters of the buildings are performed.

Link: https://doi.org/10.7712/120125.12802.26087

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TITLE:

Propagation, temporal evolution and interactions of airy gaussian beams in photorefractive crystals with both linear and quadratic electro-optic effects

AUTHOR :

Potdar G.; Katti A.
, A.N.; Yadav, A.; Kulkarni, N.S.

JOURNAL NAME:

Physica Scripta (Vol.-101, Issue-2)

DETAILS:

Published on January 2026

ABSTRACT:

We investigate for the first time, the temporal evolution, steady state propagation along with the interactions of Airy Gaussian beams in photorefractive media exhibiting both the linear and quadratic electro-optic effects. The Helmholtz equation in the paraxial approximation is used to set up the dynamical evolution equations of the beam in such photorefractive crystals. The time dependent space charge field is used to describe the temporal evolution of the photorefractive response. The analysis has been performed by solving the time dependent dynamical evolution equation through the finite difference method at different values of time and also at steady state. We consider three different values of the Gaussian control parameter in our analysis to control the number of side lobes. Diffraction effects are substantial initially when the photorefractive response is weak and not fully in force. As the photorefractive response builds up, we see suppression of self-bending of the Airy Gaussian beam and the formation of a soliton from the main lobe. The steady state propagation of Airy Gaussian beams is studied at various values of external electric field. We observe suppression of self-bending and transfer of energy from few of the side lobes to main lobes and subsequent formation of solitons and breathers as the external electric field increases and the nonlinearity is strengthened. We also study the interplay between the linear and quadratic electro-optic effect in detail by investigating the propagation of Airy Gaussian beams considering three different values of the Gaussian control parameter. Finally, we have studied the interaction of two Airy Gaussian beams in both cases of in phase and out of phase beams considering various separation distances and for three different Gaussian control parameters. We can see energy transfer between the different lobes of the Airy Gaussian beams and subsequent formation of different kind of solitons in this case including Y-type solitons, single and double peak solitons alongwith breather solitons.

Link: https://doi.org/10.1088/1402-4896/ae2e57

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TITLE:

Synergistic analysis of hydrogen-enriched diesel combustion: An integrated CFD and experimental method

AUTHOR :

Ganesh G.A.; Rajak U.; Verma T.N.; Cuce E.

JOURNAL NAME:

International Journal of Hydrogen Energy (Vol.-230)

DETAILS:

Published on April 2026

ABSTRACT:

A comprehensive examination of the function of hydrogen upgrading in diesel engines is essential, as it has its benefits and challenges. Hydrogen generally improves power and torque in diesel engines and reduces harmful emissions. This study investigates the influence of hydrogen-blended diesel fuel on the combustion and emission of compression ignition engines. Numerical simulations, along with experimental validations, were carried out using Fluent 2023 R1 version software for 5 to 15% hydrogen enrichment in diesel fuel (diesel fuel, diesel fuel + 5% hydrogen, diesel fuel + 10% hydrogen, and diesel fuel + 15% hydrogen by mass). For the combustion analysis, we figured out the cylinder pressure, temperature, and cylinder heat release rate (HRR). Results showed that hydrogen-enriched ignition dramatically raises the pressure, HRR, and temperature inside the cylinder. The maximum temperature after the expansion stroke (exhaust gas temperature) increases by 30.45% with 5% hydrogen-enriched combustion.

Link: https://doi.org/10.1016/j.ijhydene.2026.154825

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Transient Thermal Response Analysis of Al_2O_3-Graphene Hybrid Nanofluid-Enhanced Heat Pipes at Varying Inclination Angles and Heat Loads

AUTHOR :

Joshi S.; Kulkarni K.; Rathod A.; Soni A.; Pawar P.; Kolekar H.

JOURNAL NAME:

International Journal of Heat and Technology (Vol.-44, Issue-1)

DETAILS:

Published on 28 February 2026

ABSTRACT:

In this work, the transient thermal performance of a copper heat pipe containing an Al2O3-graphene hybrid nanofluid is investigated, with particular emphasis on the early stages of heat transfer, which are of utmost importance in applications involving rapid heating rates in electronic devices. Formulations of hybrid nanofluids with concentrations of 4 - 3, 3 - 2, and 6 - 3 Al2O3-graphene were prepared in a water-based fluid at a 50% filling ratio under forced-convection cooling. Experiments were conducted at heat levels of 10–20 W with a step of 5 W, with 0°, 60°, and 90° inclination angles, and transient effects were analysed at a 10-minute post-heating time point. In a comparative assessment against water, the hybrid nanofluids exhibit improved early transient heat-transfer performance, with lower thermal resistance and lower evaporator temperatures. In this series of experiments, testing at a 60° inclination yielded optimal performance for a hybrid nanofluid composition of 4 - 3. Taken in a synoptic perspective, this work demonstrates significant promise for the use of hybrid nanofluid heat pipes in efficient transient thermal management applications in contemporary electronic devices.

Link: https://doi.org/10.18280/ijht.440110

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Financial Stability and Systemic Risk in Stablecoins: When Does Digital Currency Infrastructure Become “Too Big to Fail”?

AUTHOR :

Patil A.A.

JOURNAL NAME:

Global Lessons for Stablecoin Regulation and Governance

DETAILS:

Published on January 2026

ABSTRACT:

The rapid growth of stablecoins has introduced novel forms of systemic risk to the global financial system, fundamentally challenging traditional notions of financial stability. This perspective paper examines the conditions under which stablecoins may become “too big to fail” and analyzes the unique risks posed by algorithmic and decentralized autonomous organization (DAO)-based models. Through comprehensive examination of the Terra Luna/TerraUSD (UST) collapse, Silicon Valley Bank's impact on USDC, and other significant stablecoin failures, we identify critical thresholds for systemic importance and propose an enhanced framework for assessing systemic risk in digital currency ecosystems. Our analysis reveals that traditional metrics of systemic importance inadequately capture the interconnectedness, velocity-driven risks, and reflexive mechanisms inherent in algorithmic stablecoin systems.

Link: https://doi.org/10.4018/979-8-3373-9043-7.ch004

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Targeting the Apelin–APJ Axis: A Promising Strategy to Mitigate Anthracycline-Induced Cardiotoxicity

AUTHOR :

Desai V.G.

JOURNAL NAME:

Cardiovascular Toxicology (Vol.-26, Issue-5)

DETAILS:

Published on 17 April 2026

ABSTRACT:

Anthracycline-induced cardiotoxicity remains a major clinical challenge, often progressing to heart failure years after therapy. Conventional cardioprotective agents, including angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, and beta-blockers, are widely used to preserve cardiac function; however, their effectiveness is limited by their inability to comprehensively address the complex, multifactorial pathophysiology of anthracycline-induced cardiotoxicity. This underscores the critical need for more effective and mechanism-based cardioprotective strategies that directly target the underlying molecular mechanisms, particularly oxidative stress and mitochondrial dysfunction. In recent years, the apelin–APJ signalling axis has attracted increasing attention as a potential therapeutic target in cardiovascular diseases owing to its multifaceted biological actions, including positive inotropy, vasodilation, anti-inflammatory, anti-fibrotic, anti-apoptotic, antioxidant, and pro-angiogenic effects. These pleiotropic actions are primarily mediated through the activation of key signalling pathways such as phosphoinositide 3-kinase/protein kinase B, extracellular signal-regulated kinases 1/2, and AMP-activated protein kinase. Given that these signalling cascades are disrupted during anthracycline-induced cardiotoxicity, pharmacological activation of the apelin–APJ axis may represent a promising avenue to mitigate anthracycline-associated cardiac injury with greater efficacy than conventional therapies. While native apelin isoforms (apelin-12, -13, -17, and [Pyr¹]apelin-13) are limited by their short half-lives, chemically modified analogues such as LIT01-196 and apelin-17(A2) exhibit enhanced stability and efficacy, with demonstrated cardioprotective effects in preclinical cardiovascular models and patients with chronic heart failure. However, their therapeutic potential in anthracycline-induced cardiotoxicity remains largely unexplored. This review highlights its promise as a novel cardioprotective strategy for mitigating anthracycline-induced cardiotoxicity.

Link: https://doi.org/10.1007/s12012-026-10107-w

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Web Data Concealment: An Integrated Steganographic and Visual Cryptographic Approach

AUTHOR :

Sayta K.; Wategaonkar D.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on March 2026

ABSTRACT:

During transmission of sensitive data, it is crucial to protect data from attackers. Various methods have been proposed in past like encryption, SVM, Steganalysis but these approaches are not as efficient or secure as they could be, due to issues like preprocessing needs and possible data leakage threats. These drawbacks emphasize the necessity of a more thorough strategy for data concealment that takes efficiency, security, and usability into account. An approach that effectively blends visual cryptography with steganography is required to improve data encryption and hiding capabilities that offer strong defense against unwanted access. The approach of Fusing Visual Cryptography and Steganography securely hides data and establishes secure transmission and communication. It uses digital images to hide text to solve the problem of secure communication. By combining the benefits of steganography and visual cryptography while minimizing their separate drawbacks, the suggested approach produces a reliable and adaptable web data concealment solution.

Link:
https://thegrenze.com/index.php?display=page&view=journalabstract&absid=3843&id=8

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Comparative Analysis of Machine Learning and Deep Learning Models for Parkinson's Disease Detection from Electroencephalogram (EEG) Signals

AUTHOR :

Singh K.; Bhate S.; Cerejo B.; Mantri S.

JOURNAL NAME:

2025 International Conference on Computing and Communications, COMPUTINGCON 2025

DETAILS:

Published on September 2025

ABSTRACT:

Parkinson's Disease (PD) is a degenerative condition of the nervous system that significantly impacts both movement and cognitive functions. Detecting PD in its early stages is essential for improving patient outcomes, yet traditional clinical methods often lack objectivity and consistency in early stages. In this paper, we look into a machine learning driven approach that is designed to detect PD using EEG (electroencephalogram) signals. From the EEG data we extracted a wide range of features from EEG recordings, including statistical, frequency- based, and wavelet-derived features, and used them to train both classical machine learning models (SVM, Random Forest, KNN, Logistic Regression, LDA) and deep learning architectures (CNN, RNN, ANN). We further explore data preprocessing, augmentation strategies, followed by evaluation using metrics such as accuracy, precision, recall, F1 score, and AUC. We also discuss future improvements such as attention mechanisms and transformer-based models for improved PD detection. The results validate the potential of EEG-driven machine learning systems as a potential tool for early diagnosis of Parkinson's Disease.

Link:

https://doi.org/10.1109/COMPUTINGCON64838.2025.11378192

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Morphological Operations and its Analysis on Segmentation Techniques on Brain Cancer MRI by using Machine Learning

AUTHOR :

Chanchlani A.S.; Wadhai V.M.; Thakare V.M.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

In developing countries cause of disease like brain cancer is effecting many people. Cancer is a disease where abnormal cells are produced without control and can affect other tissues, If it is identified at the early stage and treated appropriately then it can save human life. Brain Cancer MRI image processing is challenging field now a day. Brain cancer MRI processing and its analysis is act of examining images for identifying objects and analyzing their significance. Image segmentation is for detection of various kinds of unwanted cells and reviles the amount it spreads. Early detection and analysis of brain cancer is most difficult and time consuming task. Image segmentations refer to process of partitioning the image into multiple segments for locating objects and boundaries in image. This research paper presents practical implementation of morphological operations on brain cancer MRI using machine learning techniques and analysis on the effect of morphological operations on Brain Cancer MRI is done. In this paper practically implementation of various morphological operations like erosion, dilation, opening, closing and Morphological Gradient are done with the help of structuring element called as kernel. The implementation work is done by using python libraries. After applying morphological transformation minimum and maximum pixel intensity has been identified.

Link:
https://www.scopus.com/pages/publications/105034158629?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

On the Genus of Cartesian products of complete graph K12t+7 with cycles and paths

AUTHOR :

Pulgam J.A.; Malavadkar P.

JOURNAL NAME:

Journal of Combinatorial Optimization (Vol.-51, Issue-3)

DETAILS:

Published on 13 April 2026

ABSTRACT:

The genus of a graph is the minimum genus (number of "handles") of an orientable surface in which the graph can be embedded without any edges crossing. A fundamental optimization problem in network topology research is to determine genus of a graph, which is a quantitative measure of a graph's deviation from planarity. In this study, we determine the genus of the Cartesian products $K_{12t+7} \square C_{2s}$ and $K_{12t+7} \square P_s$, where $t \in Z^+ \cup \{0\}$ and $s \geq 2$.

Link: https://doi.org/10.1007/s10878-026-01416-5

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Sustainable Investing: AI-driven Air Pollution Monitoring in Smart Cities

AUTHOR :

Deshmukh R.; Jadhav B.; Kaakandikar R.; Mishra A.

JOURNAL NAME:

Sustainable Investing: Navigating Environmental, Social, and Governance (ESG) Challenges and Opportunities

DETAILS:

Published on December 2025

ABSTRACT:

For every living thing on the planet to exist and flourish, air is essential. Air pollution is a critical issue that significantly impacts public health, environmental sustainability, and economic development, especially in developing nations. The rapid urbanization and industrialization in these regions have exacerbated air quality problems, necessitating the deployment of innovative digital solutions to monitor and manage pollution effectively. This chapter explores the role of digital technologies in air pollution monitoring within the context of smart cities in India. Purpose To reduce air pollution and promote best practices, efforts must be made to fortify regional cooperation and enable a wider exchange of creative solutions, including strategies, regulations, data, and technology, alongside the capacity requirements. To control air pollution in a few selected developing nations, this research study analyses the tactics, best practices, and enabling policies that support its adoption.

The principal aim of this investigation is to examine and analyze innovative digital solutions for air pollution monitoring intelligently planned towns using digital technologies, particularly emphasizing the policies, strategies, and best practices that can be effectively implemented in the developing nation of India.

Methodology This study aims to explore new technological advancements and digital strategies that can promote environmental consciousness and help achieve the sustainable Development goals. It draws upon an in-depth analysis of existing literature, desk research, and expert interviews.

Outcomes This research offers information-based, tactical, as well as environmentally friendly smart city solutions. This study highlights the potential of cutting-edge technology and models in air quality prediction. The study examines how cities can use these pervasive technologies in conjunction with conventional approaches to enhance air quality governance and enhance quality of life. acumen to meet the demands of the fast-paced business and technology environment of today.

Link: https://doi.org/10.2174/9798898811358125010016

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Compiler Design 5.0: Enabling Intelligent Edge Computing in the Era of Industry 5.0 at Qualcomm

AUTHOR :

Ashtagi R.; Bidwe R.V.; Kamble R.; Joshi S.; Jaiswal P.; Jumbad V.

JOURNAL NAME:

2025 2nd International Conference on Integration of Computational Intelligent System, ICICIS 2025

DETAILS:

Published on September 2025

ABSTRACT:

Industry 5.0 marks the dawn of a new era in manufacturing and computing, where human-driven innovation, Artificial Intelligence (AI) integration, and edge intelligence come together. Leading the charge is Qualcomm, reimagining compiler design to address the challenges of ultra-efficient, heterogeneous computing environments. This paper delves into compiler architecture evolution under Industry 5.0 that addresses Qualcomm's approach to peak performance optimization between AI accelerators, DSPs, and multi-core processors. The case study discusses updates on machine learning aided optimization, adaptive compilation in real-time, and domain-specific languages, all fundamental for supporting interactive, contextually aware applications on the edge. The research also explores how Qualcomm uses these compiler breakthroughs to optimize the deployment of AI workloads in future IoT, automotive, and mobile platforms. Through this prism, we illustrate how Compiler Design 5.0 is not merely a technical imperative but a strategic catalyst in achieving the true promise of Industry 5.0. Unlike existing surveys, this paper uniquely frames Qualcomm's compiler innovations within the broader paradigm of Compiler Design 5.0 and Industry 5.0, highlighting the strategic role of compilers in enabling sustainable, human-centric intelligent edge computing.

Link: https://doi.org/10.1109/ICICIS65613.2025.11371109

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Synthesis and In Silico Evaluation of Novel 1,2,3-Triazole Derivatives as Antibacterial Agents with Predicted Binding Affinity for Penicillin-Binding Proteins of Methicillin-Resistant Staphylococcus aureus

AUTHOR :

Suryavanshi H.; Kulkarni S.; S A.; Rehman N.; Sairam A.; Kumar P.; Kokate K.

JOURNAL NAME:

Journal of Molecular Structure (Vol.-1362)

DETAILS:

Published on 15 June 2026

ABSTRACT:

Antibacterial resistance has emerged as a global concern, limiting the effectiveness of β-lactam antibiotics and other antimicrobials in treating infections such as skin and soft tissue infections, pneumonia, bloodstream infections, and surgical site infections. This urgent threat highlights the need for new drugs that can overcome resistance, either as standalone agents or in combination with current antibiotics. Here, we synthesised 1,2,3-triazole derivatives using a terminal alkyne and aryl/benzyl azide via a cycloaddition reaction with an Fe3O4 catalyst. The synthesised molecules were screened against Gram-positive (Bacillus subtilis NCIM 2063 and Staphylococcus aureus NCIM 2079) and Gram-negative (Escherichia coli NCIM 2065 and Proteus vulgaris NCIM 2813) bacteria and were compared with standard drugs. Among the screened compounds (SKH-01 to SKH-20), SKH-17 exhibited superior antibacterial activity compared with the other synthesised analogues. It is further analysed by in silico methods for binding affinities toward resistance determinants of methicillin-resistant Staphylococcus aureus (MRSA) using molecular docking, molecular dynamics, MMPBSA, PCA, DCCM, and FEL, and exhibits high affinities. These affinities can be further tested for potential clinical applications.

Link: https://doi.org/10.1016/j.molstruc.2026.145686

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Biped robot gait generation for uneven terrain

AUTHOR :

Haldar A.; Pagar N.D.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3344, Issue-1)

DETAILS:

Published on 9 April 2026

ABSTRACT:

Biped robots have a requirement of substituting humans to work in natural and unmanned environments. In such situation, the robots can walk on rough and uneven surfaces like rocks, sands, grassroots, mud etc. These create difficulties for the motion of the robot and undergo disposition on contact. These can be resolved by planning the optimum walking stable gait of the robot so that movement could be synchronized with respective uneven path. The biped walking of the robot causes a change in area under contact due to the pressure applied, it destabilizes the robot. To ensure its stability, parallel foot landing of the robot is proposed, this technique enables a fully actuation, equivalent force distribution of the robot on the surface and an equidistance walking path-line. It utilizes the zero moment point by nullifying the effect of the generative induced moments centralized at the centre of mass (COM) point. This work illustrates the simulation effect on its first foot travel point and ensuring stable parallel motion along with second supporting foot. In this context, a MATLAB simulation is being performed which will provide the desired motion as well as the position of the robot foot each time it completes a step during the locomotion. Further gait generation set is modelled by physical development of bipod robot which determines the trajectory and path-line of biped robot in-line with simulation executed.

Link: https://doi.org/10.1063/5.0318129

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Bridging Academia and Industry 4.0: A Structural Equation Model Approach to Educational Transformation

AUTHOR :

Gadre M.; Ramanathan K.; Parmar G.

JOURNAL NAME:

2025 IEEE Pune Section International Conference, PuneCon 2025

DETAILS:

Published on December 2025

ABSTRACT:

With Industrial revolution 4.0 cutting-edge technologies like artificial intelligence (AI), virtual reality, big data, cloud computing, analytics, simulation, the internet of things (IoT), 3D printing have gained popularity mainly in the manufacturing industries. While progressing exponentially the biggest challenge is the skill shortages, technology issues, the education system, infrastructure, curriculum, and approach to teaching to reap the benefits of this new technological development. This research explores the alignment of curricula with the changing needs of Industry 4.0, highlighting the readiness of future workforce. The study identifies 4 factors viz., teaching staff quality, curriculum quality, course material quality, and teaching pedagogy that have high impact on acquiring Industry 4.0 knowledge. The survey was carried out with 335 respondents as stakeholders-teachers, students, universities, and professionals from industry from Pune, Maharashtra, and data were analyzed using Structural Equation Modeling (SEM). The collaboration among universities, industries, and alumni can help in incorporating relevant and practical learning processes, active learning strategies, training frameworks with the requirements of the industry and interactive teaching practices. Finally, the research highlights the need to incorporate innovative pedagogical practices and well-designed course materials to close the gap between classroom learning and real-world industry applications. Through the development of industry-academia collaborations and faculty development, universities can prepare graduates with the required competencies to succeed in the fast-changing technology environment.

Link:
https://doi.org/10.1109/PuneCon67554.2025.11379278

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Next-Generation AI/ML Algorithms for Health Monitoring: Deep Learning and Neural Network Architectures

AUTHOR :

Kakade S.V.; Moantri S.

JOURNAL NAME:

Artificial Intelligence and Machine Learning in Neurology, 2 Volume Set

DETAILS:

Published on 9 January 2026

ABSTRACT:

Proficient tracking of health parameters within a person has improved in accuracy over the years with the introduction of new technologies, primarily due to the development of Artificial intelligence and machine learning, which use deep learning (DL) and neural network (NN) algorithms to thoroughly examine vast datasets for diagnostic and monitoring purposes. This chapter will analyze the latest advancements in DL and NN with regard to their applications in healthcare and the potential impacts they may have in changing the face of medicine. Section 1 focuses on how sustained health maintenance through monitoring using DL and NN models may help control chronic diseases by providing real-time evaluation of data streams from smart gadgets. The traditional methods of health tracking lack the real-time aspect entirely. Then, the study describes common DL and NN architectures used in health tracking, which include long short-term memory, convolutional neural networks, and recurrent neural networks. These models have shown great performance in image classification and time-series analysis and can be used for different types of health data. Among various healthcare services, the application of DL and NN algorithms is prominent in disease diagnosis, remote patient monitoring, and management of personalized medicines, where vital sign measurement, such as heart rate, blood pressure, and glucose levels, can be analyzed to predict and diagnose health status and outcomes. The paper also discusses the necessity of having nonoverlapping discussed datasets, model explainability, ethics, and other issues while proposing some solutions on how to advance DL models to be more dependable, less complex, and more explainable.

Link: https://doi.org/10.1002/9781394389131.ch15

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A Parametric Exponential Entropy Measure for Neutrosophic Sets and It's Application in Decision Making

AUTHOR :

Joshi V.M.; Dar J.G.; Alsheikh S.M.A.

JOURNAL NAME:

Statistics, Optimization and Information Computing (Vol.-15, Issue-5)

DETAILS:

Published on 24 February 2026

ABSTRACT:

In this paper, we propose a novel exponential entropy measure for Single-Valued Neutrosophic Sets. Neutrosophic sets as an extension of fuzzy and intuitionistic fuzzy sets, designed to handle uncertain, indeterminate, and inconsistent information in a more refined manner. The proposed entropy measure captures the degree of uncertainty inherent in single valued neutrosophic sets by simultaneously considering the truth-membership, indeterminacy-membership, and falsity-membership degrees. We establish the essential mathematical properties of the proposed entropy measure, including validation. Furthermore, illustrative examples and potential applications in decision-making is presented to validate the practical utility of the proposed measure.

Link: https://doi.org/10.19139/soic-2310-5070-3129

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

A Review of Smart Safety AI based Face Mask Detection and Classification for the Protection of Workers

AUTHOR :

Tandale S.; Bhoite S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

The safety of workers is critical, as they are often exposed to infectious materials. Ensuring their safety involves providing them with proper personal protective equipment (PPE) such as face mask. Not only wearing mask is important but also wearing correct type of mask is equally important. Different workers require to wear different type of mask depending upon the work they do. So in this case, face mask detection and classification is essential for workers to ensure their health and safety by preventing the transmission of infections. The AI based system automatically monitors and ensure compliance with mask wearing protocols. This includes improving the precision and reliability of detection algorithms in various conditions and with different types of masks. The system of detection and classification will not only promote the safety of workers' health but will also reduce the risk of spreading diseases to the public. There are systems which only detects or classifies the masks but does not include detection and classification at the same time. Also different sectors require their workers to wear different types of mask for safety. The system of detection and classification at the same time will be helpful for all sectors where their workers are required to wear correct type of mask and follow the security protocols.

Link:

https://www.scopus.com/pages/publications/105034190883

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Novel Approach for Automated Food Recognition, Nutrition and Allergy Assessment

AUTHOR :

Sonawani S.; Khilare M.; Singh V.; Kumari A.; Phatak S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

This paper presents a novel approach for automated food recognition and nutrition/allergy assessment. The proposed method utilizes transfer learning with the MobileNetV2 convolutional neural network architecture for efficient feature extraction from food images. To enhance model generalization, the training process incorporates data augmentation techniques. A densely connected neural network with dropout regularization is then employed for the final food classification. The model was evaluated on a comprehensive dataset of 101 food classes, demonstrating robust performance in accurately identifying food items and providing nutritional and allergy information. This work showcases the potential of deep learning techniques combined with transfer learning and data augmentation to enable accurate and practical food recognition systems that can assist in dietary monitoring and health management applications.

Link:
https://thegrenze.com/index.php?display=page&view=journalabstract&absid=3976&id=8

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Machine Learning Algorithms in Early Detection of Chronic Diseases Applications of Supervised and Unsupervised Learning for Early Diagnosis and Risk Prediction

AUTHOR :

Devkar V.; Mantri S.

JOURNAL NAME:

Artificial Intelligence and Machine Learning in Neurology, 2 Volume Set

DETAILS:

Published on 9 January 2026

ABSTRACT:

Early diagnosis of chronic diseases is very important for better patient results, lowering healthcare costs, and easing the stress of long-term problems. In this field, machine learning (ML) methods have become very useful because they can analyze very large and complicated medical records and make accurate and fast diagnoses. This chapter talks about how supervised and uncontrolled learning can be used to find chronic diseases early and predict their risks. Many researchers use supervised learning algorithms, like decision trees, support vector machines (SVM), and neural networks, to sort disease states into groups and guess risk factors based on datasets that have already been identified. These techniques work especially well for finding disease signs in organized data, like patient information, lab results, and imaging studies. Random forests and gradient boosting are two models that are used because they are good at dealing with lost values and feature selection. Using methods like grouping and dimensionality reduction in unsupervised learning can help you find unseen patterns and connections in data that has not been named. Some examples of clustering algorithms are k-means and hierarchical clustering, which help find groups of patients with similar risk profiles. Another example is principal components analysis (PCA), which makes it easier to get features from large datasets like genome and protein data. Combining controlled and unstructured learning methods gives early analysis a more complete look. To make diagnoses more accurate and predictions more accurate, hybrid models use the best parts of both theories. There are also problems with data quality, ease of use, and scaling that are talked about. This shows how important it is for AI in healthcare to be moral and easy to understand. This research shows how machine learning algorithms could change the way chronic diseases are managed, making way for personalized treatment and proactive healthcare measures.

Link: https://doi.org/10.1002/9781394389131.ch26

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Design and Development of an IoT-Driven Automated Plant Management System: Integrating Machine Learning and Mechanical Innovations for Optimized Growth and Irrigation

AUTHOR :

Kanade A.; Annadate P.; Mirasdar I.; Bedekar M.
.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-2)

DETAILS:

Published on July 2025

ABSTRACT:

Efficient plant management is critical for sustainable agriculture and resource conservation. This study presents an innovative automated system that leverages IoT and machine learning (ML) technologies to optimize plant growth and irrigation practices. The system integrates a sun-tracking module, automated watering mechanisms, and robust ML models—linear regression, random forest, and gradient boosting regressors. Environmental factors such as sunlight exposure, temperature, humidity, soil type, and water frequency were analyzed to predict optimal watering hours. The methodology involved feature engineering, model evaluation, and system design, emphasizing minimal manual intervention. Results indicate that linear regression outperformed other models with an MSE of 0.272 and an R2 of 0.880, highlighting its simplicity and efficiency. A fidget spinner-inspired water distribution mechanism and Arduino-based sun trackers were incorporated to ensure even water distribution and optimal sunlight exposure. The proposed system demonstrated significant improvements in water-use efficiency, durability, and convenience.

Link:
https://www.scopus.com/pages/publications/105034907943?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Mitigating Transportation Risks: Addressing Safety Challenges in Inclement Weather Conditions

AUTHOR :

Bhoite S.; Zope R.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

Frequent accidents resulting from adverse weather conditions worldwide have prompted the need for improved safety measures. Tragic events like automobile disasters, train derailments, airline crashes, and ship collisions have been featured in recent headlines. This paper presents deep convolutional neural networks (CNNs), namely Sequential, VGG, and ResNet50 models, for weather condition recognition by utilizing the progress made in deep learning. The dataset used in this study encompasses real-life data collected from Kaggle. The dataset comprises images representing five distinct weather classes, such as Shine, Rainy, cloudy, foggy, and sunrise, emphasizing the practical challenges that any weather classification system must address. With approximately 1500 labelled images, including validation data, the dataset reflects the variability in image dimensions and sizes. Based on the specified class, each photograph is arranged into distinct folders and corresponds to a specific weather category. The analysis of numerous experiments shows that the suggested ResNet50 outperforms Sequential and VGG algorithms in terms of recognition accuracy. This research on deep learning-based weather condition recognition using CNNs addresses the urgent need for enhanced safety measures in transportation, aiming to mitigate frequent accidents caused by adverse weather conditions worldwide, thereby contributing to societal well-being and safety. Moreover, the societal impact extends beyond transportation safety, influencing various sectors dependent on weather-sensitive activities such as agriculture, emergency response, and urban planning.

Link:
https://www.scopus.com/pages/publications/105034087226?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Natural Language Processing in Digital Humanities: Analysing Literary Trends Through Machine Learning

AUTHOR :

Bajaj A.; Karad V.; Panicker K.; Jha A.; Sunena Rose M.V.; Damre S.S.

JOURNAL NAME:

Proceedings of 2025 10th International Conference on Science Technology, Engineering and Mathematics, ICONSTEM 2025

DETAILS:

Published on November 2025

ABSTRACT:

This research utilizes GPT-4 fine-tuning and longformer architectures and applies it to learning the evolutionary trends by using 50,000 texts (five books per century). We use combination of Robertatopicmixing and Temporal Convolutional Networks for quantify the migration of themes, style changes and evolutions in narrative structures with 93.8% classification accuracy. The framework makes use of UMAP as dimensionality reduction and HDBSCAN algorithm as the clustering algorithm in order to identify 127 different literary movements with previously unrecorded cross culture influences. Naming entities from spaCy Transformer pipelines, 3.2 Million character networks analysis of social networks and fictitious relationships extracted. For the visual image generation for the abstract literary theme, we have used DALL-E and for under resourced language analysis using zero-shot classification using SetFit. Validation of annotation against expert annotation gives 89% agreement and prove the computational methods as complementary tool for literary and cultural heritage preservation.

Link:
https://doi.org/10.1109/ICONSTEM65670.2025.11374443

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Analyzing cricket bowling actions using OpenCV and mediapipe

AUTHOR :

Koli S.; Bedekar M.; Apte R.; Aradhye S.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3369, Issue-1)

DETAILS:

Published on March 2026

ABSTRACT:

This research explores the use of OpenCV and Mediapipe to analyze cricket bowling biomechanics. By capturing and processing video data, key landmarks - wrist, elbow, and shoulder - were tracked, and their trajectories were plotted to study variations in bowling techniques. The visualizations, presented in video frames and graphs, allowed for detailed comparisons of joint movements. Using Euclidean distance, the consistency and variation in wrist trajectories across different deliveries were measured, providing a quantitative assessment of the bowler's action. A professional bowling coach validated these findings, confirming the method's accuracy and reliability. This study highlights that visualizing and comparing joint trajectories can reveal significant technique variations, offering substantial implications for cricket coaching. Coaches can use trajectory graphs to evaluate a bowler's consistency, identify improvement areas, and achieve a more uniform technique. Additionally, this analysis helps in injury prevention by detecting harmful techniques early for timely correction. The biomechanical insights enable coaches to fine-tune techniques to optimize performance, such as increasing ball speed or accuracy.

Link: https://doi.org/10.1063/5.0317454

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Explainable AI-Integrated Training Recommendation Framework for Skill Development

AUTHOR :

Sarada V.; Diana P.D.; Shaikh M.; Kumari A.; Kumari A.; Joshi N.R.

JOURNAL NAME:

Proceedings ICECONF 2025 - 2025 2nd International Conference on Artificial Intelligence and Knowledge Discovery in Concurrent Engineering

DETAILS:

Published on October 2025

ABSTRACT:

The adoption of Explainable Artificial Intelligence (XAI) in the list of training recommendations into the changing landscape of skill learning is a novel approach to personalised learning. The given research suggests a new XAI-principled training-recommendation system, in which the Reinforcement Learning (RL) will be integrated into the system to increase the openness and flexibility of the learning skimming channels. The suggested framework involves RL-based recommendation engine to serve dynamic recommended training modules based on profile of particular learners, and the XAI techniques to present justifiable explanations to the recommended training modules. With the addition of XAI to the learning process, the experience would be more intimate, though the trust and interest would also be based on the reasoning behind the very existence of all the suggestions in the first place. This two fold strategy will mean that the learners will not only be steered towards the best training opportunities, but they will also know the reasoning behind their learning experiences and this will make them make better decisions to continue learning the skills.

Link:
https://doi.org/10.1109/ICECONF65644.2025.11379388

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Enhanced Faster R-CNN for Real-Time Underwater Object Detection

AUTHOR :

Sisodiya P.; Bhoite S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

Detecting objects in underwater environments remains a critical challenge due to factors such as low visibility, noise, and severe image distortion. These challenges hinder the efficient monitoring of marine biodiversity and sustainable resource management, which are essential for addressing global ecological and economic concerns. This research proposes a novel approach to underwater object detection by enhancing the Faster R-CNN framework with several state-of-the-art techniques. Key innovations include the integration of Res2Net101 for multi-scale feature extraction, Generalized Intersection over Union (GIoU) for bounding box regression, and Soft Non-Maximum Suppression (Soft-NMS) to refine detection results. Additionally, Online Hard Example Mining (OHEM) addresses class imbalance during training, while mosaic data augmentation and multi-scale training improve model robustness and accuracy. The proposed model improves performance in challenging underwater environments, offering precise real-time object detection capabilities. This work has significant implications for marine ecological research, environmental monitoring, and the sustainable management of aquatic resources. By advancing automated detection systems, the study supports efforts to mitigate human impact on marine ecosystems and contributes to conservation initiatives.

Link:
https://www.scopus.com/pages/publications/105034111136?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Experimental Investigation and Genetic Algorithm Optimization-Assisted ANN Modelling of Rhodamine B Adsorption Onto Biochar/MXene Composite

AUTHOR :

Mayilswamy N.; Kandasubramanian B.; Gore A.; Sonawane R.; V P B.

JOURNAL NAME:

Water, Air, and Soil Pollution (Vol.-237, Issue-12)

DETAILS:

Published on 30 March 2026

ABSTRACT:

The current work accentuates the fabrication and advanced characterization of sewage sludge biochar/ MXene (SSB/MXene) composite via a solvent-free ball-milling methodology for the sustainable remediation of Rhodamine B (RhB)-laden aqueous solution. SSB/MXene adsorbent exhibited an utmost monolayered Langmuir adsorption capacity (qmax) of 14.95 mg g−1, at RhB concentrations of 15 mg L−1, with a maximum RhB removal efficacy of 99.89%. RhB batch adsorption experiments signified that dye decolorization follows pseudo-second-order kinetics, designating chemisorption, while the Langmuir adsorption isotherm confirmed homogeneous mono-layered adsorption. The RhB batch adsorption experimental results were modelled via an Artificial Neural Network (ANN) modelling-based soft computing approach employing the Levenberg–Marquardt (LM) Backpropagation Algorithm, optimized by Genetic Algorithm. The designed ANN model exemplified a strong relationship between the empirical and ANN-prognosticated adsorption capacities, ascribable to higher determination, and correlation coefficients (R2: 0.9916, R: 0.9954), as well as minimal mean square error (0.3534), mean absolute error (0.2385), and root mean square error (0.4883), demonstrating robust predictiveness towards multi-variate adsorption, thereby enabling reliable AI-driven process forecasting. This work thus establishes SSB/MXene composite as a high-performance, sustainable adsorbent, while the ANN framework imparts a scalable, data-intelligent pathway for next-generation wastewater remediation.

Link: https://link.springer.com/article/10.1007/s11270-026-09392-6

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Experimental testing of paraffin wax propellant grains in ducted rocket engines with added additives

AUTHOR :

Saxena P.; Birajdar M.; Patel Y.; Siddharth P.; Gowda S.; Hashim S.A.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3369, Issue-1)

DETAILS:

Published on 18 March 2026

ABSTRACT:

The primary combustion chamber and the secondary combustion chamber of the hybrid ducted rocket, also known as the Ducted Propulsion System (DPS), are used in this configuration to allow for the full burning of the fuel in the secondary combustion chamber. With gaseous oxygen acting as the oxidizer, paraffin wax is used as the primary fuel in this investigation. These days, paraffin wax also known as a liquefying fuel is receiving a lot of attention as the preferred solid propellant grain for hybrid rocket propulsion setups. It functions by liquefying the propellant grain's outermost layer, which permits a higher rate of combustion and regression. Numerous studies and experiments are being carried out on the subject. The experiments in the present study are conducted using pure paraffin wax as the control. Aluminium is found to have a higher energy release when its particles burn, improving the specific impulse, energy density, and regression rate of the propellant grain. Therefore, this study uses different compositions of aluminium and boron as additives in the paraffin wax to determine the regression rates and combustion performance using either a ducted propulsion system or a hybrid ducted rocket. The NASACEA analysis for the identical additive compositions that we employed in the experiment is also conducted for the present study. A same mass flow rate of the gaseous oxidizer is being used in the experiments, along with the same propellant grain size and weight.

Link: https://doi.org/10.1063/5.0317437

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Deep Spectrogram-Based EEG Decoding of Visual Stimuli Using a Novel CNN Architecture

AUTHOR :

Tamhankar A.; Kokare A.; Khedekar L.; Chincholkar A.B.; Dhawas P.; Raut S.

JOURNAL NAME:

2025 IEEE International Conference on Recent Advances in Computing and Systems, ReACS 2025

DETAILS:

Published on December 2025

ABSTRACT:

Electroencephalography EEG - based decoding of visual stimuli has gained traction in computational neuroscience and brain-computer interface applications. This study explores the feasibility of using EEG spectrograms to classify visual stimuli using deep learning. A novel convolutional neural network, SpectrCNN, was developed, consisting of 6 convolutional layers, 2 dropout layers, 1 batch normalization layer, 1 max pooling layer, 1 flatten layer, and 1 fully connected (linear) layer. The model achieved a test accuracy of over 90% across 20 classes, demonstrating its capability to extract meaningful spatial patterns from EEG spectrograms. While dataset imbalance posed a challenge, SpectrCNN outperformed existing EEG-based classification methods, reinforcing the potential of deep learning in neural signal interpretation. These findings contribute to advancements in cognitive neuroscience, offering prospects for future developments in EEG-based image reconstruction and brain-inspired artificial intelligence.

Link: https://doi.org/10.1109/REACS67479.2025.11413261

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Vision Transformers-Based Structural Health Monitoring System for Bridge Safety

AUTHOR :

Choudari S.; Gosavi S.; Ramu B.; Hemalatha J.; Pawar S.; Al Nidal Al Said N.

JOURNAL NAME:

Proceedings ICECONF 2025 - 2025 2nd International Conference on Artificial Intelligence and Knowledge Discovery in Concurrent Engineering

DETAILS:

Published on October 2025

ABSTRACT:

In this paper, a Vision Transformers-Based Structural Health Monitoring System to Bridge Safety, a Hybrid Vision Transformer (ViT) + CNN architecture, multi-sensor fusion, and Reinforcement Learning (RL) are used to improve the accuracy, efficiency, and scalability of bridges monitoring. The proposed system combines ViTs, used to extract global features, and CNNs, used to detect local anomalies, up to 95 % accuracy in identifying damage. The multi-sensor fusion adds strength to the model as it is less sensitive to the weather and lighting conditions. Moreover, a Reinforcement Learning agent will self-optimize maintenance schedules, minimizing unnecessary maintenance and increasing bridge lifespan. The system demonstrates the use of PyTorch, Hugging Face Transformers and OpenAI Baselines to provide fast processing and real time performance using edge cloud hybrid architecture. This paper has shown that such a system results in an improvement of the detection accuracy, as well as the efficiency of the operations, which are capable of providing a holistic solution to the long-term management of bridges safety.

Link:
https://doi.org/10.1109/ICECONF65644.2025.11379672

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

YOLOv8 based real-time underwater fish monitoring framework: detection, tracking, and counting

AUTHOR :

Garg R.; Phadke A.C.

JOURNAL NAME:

Bulletin of Geophysics and Oceanography (Vol.-67, Issue-1)

DETAILS:

Published on 20 January 2026

ABSTRACT:

YOLO (You Only Look Once) is one of the most popular computer vision algorithms. Computer vision has revolutionised the field of moving object detection in real time with its ability to analyse and understand visual content much like a human. This paper presents a comprehensive framework for fish detection, bounding box-based tracking, and counting in underwater environments using the YOLOv8 deep learning architecture. Accurately and efficiently identifying, tracking, and counting fish plays an important role in aquatic research, conservation efforts, and fishery management. The proposed system uses a pre-trained YOLOv8 model which is fine tuned using a large annotated dataset of underwater fish images. The model is improved using transfer learning to learn features specific to fish detection in water. Real-time underwater fish detection is performed on underwater video streams using a fine-tuned YOLOv8 model. The high speed and accuracy of YOLOv8 enables efficient localisation of fish instances at every frame. The analysis of such data enables accurate fish counts and facilitates effective monitoring and assessment of fish populations in water bodies. The true positive rate of 0.91 and accuracy of 92% indicated that the system successfully identified a significant proportion of fish instances present in the images.

Link: https://bgo.ogs.it/issues/2026-vol-67-1/yolov8-based-real-time-underwater-fish-monitoring-framework-detection-tracking

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Review Of Stir Casting Techniques For Aluminum Metal Matrix Composites: Applications In Underwater Exploration Frame Fabrication

AUTHOR :

Dhavale S.A.; Barve S.B.

JOURNAL NAME:

Composites: Mechanics, Computations, Applications (Vol.-17, Issue-1)

DETAILS:

Published on 22 January 2026

ABSTRACT:

This investigation is focused on the fabrication of aluminum metal matrix composites through utilization of the stir casting methodology. The appeal of tailor-made composites to researchers lies in their easy fabrication method and the consequent improvement in material properties. Notably, aluminum alloy metal matrix composites exhibit significant relevance for applications in challenging environmental conditions, such as those encountered in space or marine environments. A review has been undertaken to explicate the fundamental aspects essential to the stir casting process. An exploration of multiple pouring methods within the stir casting framework has been conducted. The review is carried out to fabricate the material required for the frame of the remotely operated vehicle in underwater exploration.

Link:

https://www.scopus.com/pages/publications/105033711319?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Rail Safe Vision: Real-Time Railway Track Hazard Detection and Signal Alert System

AUTHOR :

Chanchlani A.; Nimbalkar V.P.; Kumar V.; Bharadwaj S.; Gohil V.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

The RailSafe Vision project is aimed at achieving a novel solution by bringing in Computer vision and Machine learning methods to improve the safety in railway network. The system is dedicated to detecting on-track hazards in real-time as well as accurately interpreting railway signals, being able to greatly minimize chances of human errors and unforeseen obstacles. The solution makes use of machine learning models for object detection and image processing (Yolo, OpenCV) granting the system fast response times - all to help quickly alert train operators about potential obstacles. RailSafe Vision logs event data continuously, so it supports the work of post-incident investigations as well as ongoing safety improvement. This approach is putting Railtrack on a track toward better rail operations and service efficiency in Britain's railways (Swainston 2002).

.Link:
https://www.scopus.com/pages/publications/105034211895?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Enhancing Portfolio Optimization with Machine Learning: A Comparative Analysis

AUTHOR :

Panchal D.V.; Wadhokar M.J.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

As financial markets become increasingly complex, traditional portfolio optimization methods face significant challenges in managing risk and maximizing returns. This study explores the integration of machine learning techniques, specifically neural networks and decision trees, into portfolio management. Building on the foundation laid by Heaton, Polson, and Witte [1], the research investigates how these advanced algorithms can enhance portfolio performance by adapting to market dynamics. The findings indicate that machine learning models provide a more flexible and robust approach to portfolio optimization, offering improved outcomes in both risk management and return generation. This study emphasizes the potential of machine learning to revolutionize investment strategies by delivering more adaptive and efficient portfolios.

.Link:
https://www.scopus.com/pages/publications/105034068412?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Low Warping and High Toughness Recycled High Density Polyethylene for Fused Filament Fabrication 3D Printing

AUTHOR :

Gopal A.; Chaubal A.; Shanmuganathan K.

JOURNAL NAME:

Polymer Engineering and Science

DETAILS:

Published on 2 April 2026

ABSTRACT:

The incorporation of recycled polymers in additive manufacturing offers a sustainable pathway to reduce plastic waste while enabling cost-effective production of functional components. High-density polyethylene (HDPE) is an attractive material for 3D printing owing to its low density, chemical resistance, and recyclability. However, its high crystallinity and tendency to shrink often lead to warpage and poor interlayer adhesion. This study proposes a blend-based strategy to overcome these limitations by incorporating tough linear low-density polyethylene (LLDPE) into recycled HDPE (rHDPE). The blends were prepared through melt extrusion, and their mechanical, rheological, morphological, and thermal properties, and 3D printability were comprehensively evaluated. rHDPE/LLDPE blends showed a remarkable improvement in elongation at break (from 3.2% to 84.7%) and toughness without compromising tensile strength. Addition of LLDPE led to a moderate reduction in the crystallinity of rHDPE/LLDPE blends (from 69% to 52.5%) but a significant reduction in the warpage of 3D printed samples (from 27% to 7.6%). Rheological and morphological analyses confirmed good miscibility and uniform phase distribution in the blends, with increasing LLDPE content enhancing complex viscosity and melt elasticity. Overall, the rHDPE/LLDPE blends exhibit superior mechanical performance and reduced warpage, establishing their potential for FFF 3D printing applications.

Link: https://doi.org/10.1002/pen.70507

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Reimagining Consumer Experience in the Digital Age: A Strategic and Technological Perspective

AUTHOR :

Bharathi D.; Banerjee S.; Gupta A.A.; Gaurav K.; Ray A.S.; Rani K.S.

JOURNAL NAME:

The Strategic Evolution From Omnichannel to Metachannel Marketing

DETAILS:

Published on October 2025

ABSTRACT:

In the contemporary digital landscape, consumer experience has emerged as a strategic differentiator and a critical determinant of organizational success. This chapter is intended to elaborate the changing face of customer experience in the digital era, especially with emerging technologies, data- driven strategies, and changing consumer expectations, radically changing traditional business to consumer interactions. Advanced tools like artificial intelligence, machine learning, big data analytics, and augmented reality are changing methods of designing, delivering, and managing customer interactions across digital and physical environments is, therefore, pertinent. In emphasizing aspects of personalization, immediacy, and engagement in real time, all these have dramatically changed consumer expectations and call for a rethink for omnichannel consistency and seamless integration. This chapter presents a realistic and future oriented picture of how an organization can strategically reinvent consumer experience in the digital age.

Link: https://doi.org/10.4018/979-8-3373-4591-8.ch006

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Cost Overrun Analysis Of Water Resources Projects

AUTHOR :

Chowgule V.; Kulkarni K.H.

JOURNAL NAME:

Larhyss Journal (Vol.-2026 March, Issue-65)

DETAILS:

Published on March 2026

ABSTRACT:

Rising population, industrialization, urbanization, and agricultural expansion are expected to drive up demand for irrigation projects. This study focuses on analyzing cost overruns in dam projects in Maharashtra's Konkan area, specifically in the basin of west-flowing rivers. Based on data from a few chosen projects, cost overruns and project underperformance have been determined. It has become extremely challenging to execute infrastructure projects on time and within the budget allocated, which frequently creates a burden on the state treasury. Determining the primary root causes of cost overruns in water-sector construction projects and proposing improvements are the main goals of this study. Issues with site acquisition, excess quantity execution, and project scope variations require priority. To prioritize the influencing factors, Garrett's ranking technique was employed. A detailed questionnaire was circulated among contracting agencies and officials from the irrigation department. The analysis highlighted major causes of cost escalation, including paucity of funds, excessive costs due to high tender rates, delays in land acquisition, increased land acquisition costs, and claims for additional work involving boulders. Furthermore, the Earned Value Method (EVM) was utilized to assess the performance of an ongoing dam construction project, offering insights into cost and schedule efficiency. The findings of this study are intended to assist policymakers, planners, and project managers in implementing effective control mechanisms to mitigate cost overruns in future irrigation infrastructure developments.

Link:
https://www.larhyss.net/ojs/index.php/larhyss/article/view/16795

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Challenges and Opportunities in Real-Time Data Processing: Advancements and Limitations in Real-Time Data Analytics

AUTHOR :

Patil R.S.; Moantri S.
.

JOURNAL NAME:

Artificial Intelligence and Machine Learning in Neurology, 2 Volume Set

DETAILS:

Published on 9 January 2026

ABSTRACT:

In real-time data analytics, automation of insight generation and decision-making has transformed operational activities of different industries. The purpose of this study is to consider prospects and challenges related to real-time analytics, with focus given to recent changes and limitations from more recent developments. One of the key areas of concern is velocity and volume of data, which is also referred to as data creation rate and data generation rate, respectively, as they demand appropriate, simple, and easily scalable management infrastructures. Tools such as Apache Kafka or Apache Flink are important because traditional batch systems do not deal with data floods. Analysis is done almost in real time, which enables businesses to obtain faster insights than before. Achieving sufficiency in latency minimization while maintaining real-time operability is another challenge. Control and security are still primary issues together with data accuracy because erroneous data in a real-time environment can result in catastrophic decision networks if unchecked and will gravely affect decision-making. All in all, the advantages of real-time data processing outweigh the challenges. It makes businesses and other firms responsive to operational changes and volatileness and improves customer service. In the health industry, for example, real-time data may be useful in early disease detection and for creating personalized medicine plans. When handling such sensitive data, privacy and security become critically important. The integrated nature of many real-time systems may prevent certain companies from adopting new technologies. Nonetheless, real-time data capture and data streaming processing, probably beneficial across multiple sectors, should not be overlooked.

Link: https://doi.org/10.1002/9781394389131.ch24

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Soybean Leaf Disease Detection Using Deep CNN Architectures for Precision Agriculture

AUTHOR :

Patil J.; Kinger S.; Ghanekar A.; Sebait S.; Adamjee S.

JOURNAL NAME:

2025 International Conference on Computing and Communications, COMPUTINGCON 2025

DETAILS:

Published on September 2025

ABSTRACT:

Soybean leaf diseases pose a significant threat to agricultural productivity, particularly in regions like Maharashtra, India, where timely disease identification is crucial for effective management. This study proposes a deep learning-based approach for the early detection of soybean leaf diseases using state-of-the-art convolutional neural network (CNN) architectures, including EfficientNetB0, DenseNet121, MobileNetV2, ResNet50, and InceptionV3. The novelty of this work lies in the integration of advanced CNN models with robust preprocessing and data augmentation techniques to enhance classification accuracy and reliability. The models were trained on a curated dataset of soybean leaf images, achieving high accuracy across multiple disease categories. The final results were verified using GradCAM++. This approach addresses key challenges in agricultural disease detection by ensuring scalability and precision in real-world applications. The proposed system has practical implications for farmers, enabling early disease diagnosis, reducing crop losses, optimizing pesticide use, and promoting sustainable farming practices. Future work will focus on real-time deployment and further refinement of the models to support dynamic disease management strategies.

Link:
https://doi.org/10.1109/COMPUTINGCON64838.2025.11376896

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Innovative machine learning techniques for estimating patient length of stay and mortality risk

AUTHOR :

Khadangale I.; Palwe S.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3369, Issue-1)

DETAILS:

Published on 18 March 2026

ABSTRACT:

When it comes to healthcare, optimizing resource allocation, improving patient outcomes, and enhancing healthcare delivery hinge on accurately predicting patients' length of Stay (LOS) and mortality risks. This paper presents the findings of a comprehensive literature analysis of LOS and mortality risk prediction using cutting-edge ML algorithms. Conduct an exhaustive literature search to learn about the algorithms, datasets, methods, and performance metrics used in this field. Significant results from the literature indicate that advanced ML methods, such as feature engineering, ensemble techniques, and deep learning, successfully forecast patient outcomes. Some of the biggest problems and restrictions with how research is going right now include data heterogeneity, missing values, and concerns about how interpretable the models are. This review emphasizes the need for advanced ML approaches to construct robust predictive models for LOS and mortality risk prediction in hospital settings. This work synthesizes learning from the current literature, which will be helpful for future research efforts to improve healthcare predictive analytics.

Link: https://doi.org/10.1063/5.0317709

Since 1983

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Multi-Objective Variance-Bias Tradeoff Optimization of ANN by Hybridizing with Multi-Objective GA for Water Discharge Estimation

AUTHOR :

Yadav A.; Pradhan A.K.; Kumar M.; Sharma P.; Maakar S.K.; Singh S.; Batta U.; Joshi D.

JOURNAL NAME:

Water Resources Management (vol.-40, Issue-5)

DETAILS:

Published on 28 March 2026

ABSTRACT:

Water discharge (WD) is a crucial element of river hydrodynamics. The assessment of WD in dam design and river engineering studies is crucial. Proper WD from a barrage or dam must be regulated to prevent downstream floods during rainy season. WD encompasses numerous complex nonlinear processes and factors that traditional approaches are not able to address such complexities. To address these chllanges, hybrid multi-objective optimisation Genetic algorithm(GA) based artificial neural network(ANN) (MOO-GA-ANN) with automated parameter tuning model is proposed to optimizes the variance-bias trade-off for WD estimation in Mahanadi river (MR), India. These approaches optimises the two conflicting responses bias and variance with all artificial neural network(ANN) model parameters optimisation simulateneously to enhance robustness and generalisation capability of the model. The MOO-GA-ANN is developed using hydro-climatic data (Tempearature(T), Rainfall(R), water level(WL), and Suspended sediment yield(SSY)) as input parameters to estimate WD at the most downstream gauge location(Tikarapara) in the MR. Multiple linear regression (MLR), standalone ANN and single-objective GA-based ANN (GA-ANN) models are used for comparison from the MOO-GA-ANN on the basis of the statistical error metrics performances evaluation. Results indicates that the hybridised MOO-GA-ANN model has produced the most accurate and efficient results compared to other models for estimating WD in MR. The proposed model can be potentially used to estimate WD at both ungauged or gauged sites in the absence of measured WD because of its high performance and simplicity of use.

Link:

https://link.springer.com/article/10.1007/s11269-026-04584-5

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

The Role of Flavonoids in Inflammatory Bowel Disease

AUTHOR :

Polshettiwar S.; Kulkarni S.; Upaganlawar A.; Ozarde Y.; Mahajan N.; Deshmukh C.

JOURNAL NAME:

Autoimmune Disorders and Secondary Plant Metabolites (Part 2)

DETAILS:

Published on December 2025

ABSTRACT:

Inflammatory Bowel Disease (IBD), encompassing ulcerative colitis and Crohn's disease is a chronic condition involving inflammation of the Gastrointestinal Tract (GIT) characterized by periods of remission and exacerbation. The pathogenesis of IBD involves a complex influence of genetic, environmental, microbial, and immunological factors. Conventional treatments, including corticosteroids, immunosuppressants, and biologics, often have significant side effects and do not provide a cure, highlighting the need for alternative therapeutic approaches. Flavonoids, a diverse group of poly-phenolic compounds found in vegetables, fruits, and certain beverages, have garnered significant attention due to their anti-inflammatory, antioxidant, and immunomodulatory properties. The present chapter explores the considerable role of flavonoids in the management and treatment of IBD, involving their mechanisms of action, therapeutic benefits, and evidence from preclinical and clinical studies. Key mechanisms by which flavonoids exert their beneficial effects include modulation of inflammatory pathways, inhibition of proinflammatory cytokines, suppression of oxidative stress, and regulation of gut microbiota composition. Preclinical studies using animal models of IBD have demonstrated that flavonoids can mitigate inflammation, decrease disease severity, and improve histopathological outcomes. Clinical trials, although limited, have provided preliminary evidence supporting the efficacy of flavonoid supplementation in reducing clinical manifestations and inflammatory markers in IBD patients. Despite the encouraging data, challenges remain regarding the bioavailability, dosage, and long-term safety of flavonoid supplementation. Future research should focus on optimizing delivery methods, elucidating the synergistic effects of flavonoid combinations, and conducting large-scale, well-designed clinical trials to establish standardized guidelines for their use in IBD management.

Link:

https://www.benthamdirect.com/content/books/9798898812799.chapter-2

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Nanoparticle-reinforced Aluminium Matrix Hybrid Composites: Processing and Characterization

AUTHOR :

Shinde S.S.; Barve S.B.

JOURNAL NAME:

Journal of Environmental Nanotechnology
(Vol.-15, Issue-1)

DETAILS:

Published on April 2026

ABSTRACT:

In the pursuit of high-performance materials for demanding applications, the development of hybrid composites has emerged as a breakthrough solution. In the present work, A356 matrix hybrid nanocomposites reinforced with boron carbide (B4C) (1, 2, 3, 4, and 5 wt.%) and zirconium dioxide (ZrO2) (1 wt.% constant) were produced by the two-step stir casting technique assisted by ultrasonic vibrations. Microstructure, mechanical characteristics, and tribological behaviour of A356–B4C–ZrO_2 hybrid composites were investigated. The impact of T6 heat treatment on the mechanical characteristics of the prepared composites was also examined. The microhardness, yield strength, and ultimate tensile strength of the hybrid composites showed improvements of 35%, 66%, and 60%, respectively, compared to the A356 matrix. The fracture morphology of the hybrid nanocomposites was analyzed using scanning electron microscopy. The even dispersion of nanoparticles achieved through mechanical stirring and ultrasonic vibration assistance, along with microstructural changes such as precipitation hardening and spheroidization of silicon particles due to thermal treatment, significantly lowered the wear rate and friction coefficient.

Link: https://doi.org/10.13074/jent.2026.03.2531789

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Comparative Analysis of Deep Learning Techniques in Alzheimer's Disease Diagnosis: Trends, Challenges, and Future Directions

AUTHOR :

Naik D.R.; Savyanavar D.A.

JOURNAL NAME:

MethodsX (Vol.-16)

DETAILS:

Published on February 2026

ABSTRACT:

Alzheimer's disease is a slow, progressive neurological disorder that impacts the brain tissue and causes cells to die, the most common reason for dementia. It typically reduces brain volume, subsequently impairing several cognitive functions. We explored the phases of Alzheimer's disease diagnosis by thoroughly analysing the paper and highlighting the significance of pre-processing methods. Artificial intelligence progress has transformed medical image analysis by enabling automatic, precise identification of Alzheimer's disease through hybrid architectures, convolutional neural networks, and transfer-learning-based models. This article includes applications of Alzheimer's disease based on datasets, Artificial Intelligence models, limitations, pre-processing methods, challenges, and current research in this area. The article lists various medicinal modalities, risk factors for Alzheimer's disease, the disease's progression stages, and different criteria for evaluating the performance of Artificial Intelligence models. Accuracy, precision, confusion matrix, AUC, F1-score, ROC, recall, and MCC are some of the metrics covered in this paper. The paper discusses the number of comparisons of various deep learning techniques for Alzheimer's, new trends, limitations, recommendations, and future directions. Finally, the paper shows the ongoing practical outcomes and difficulties in Alzheimer's situations. Building on the analysis, this survey helps to cover different dimensions of Alzheimer's disease that have not been previously considered.

Link: https://doi.org/10.1016/j.mex.2026.103844

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Surface functionalization techniques for improved additive manufacturing of aramids

AUTHOR :

Kulkarni D.S.; Indalkar A.; Gupta S.; Kandasubramanian B.

JOURNAL NAME:

Bulletin of Materials Science (Vol.-49, Issue-2)

DETAILS:

Published on March 2026

ABSTRACT:

Aramid fibres serve as exceptional reinforcements in composite materials owing to their combination of high modulus, superior specific strength and low density. Their remarkable properties make them well-suited for additive manufacturing (AM) applications. However, their smooth, chemically inert surface limits fibre–matrix bonding. Surface modifications enhance surface roughness and chemical activity, improving adhesion and composite performance. Unlike conventional methods, AM offers precise control over material distribution, fibre alignment and complex geometries, enabling lightweight, strong structures. Aramid fibre-reinforced polymers produced through AM show enhanced tensile strength, superior impact resistance and enhanced thermal stability, rendering them highly advantageous for aerospace, automotive and defence industries. Fused filament fabrication and selective laser sintering, which are the recent advancements in AM technologies, have improved fibre dispersion and orientation in both thermoplastic and thermosetting matrices, while reducing material waste and supporting sustainability. Despite these benefits, challenges like fibre breakage, anisotropic mechanical properties and poor interfacial adhesion persist. Future research should focus on printing parameter optimization, developing novel fibre–polymer compatibilization techniques, and exploring hybrid reinforcements to further improve AM-fabricated aramid composites. As AM evolves, it holds significant potential to transform composite manufacturing through enhanced design flexibility, efficiency and mechanical performance.

Link: https://doi.org/10.1007/s12034-025-03535-x

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Sustainable Investing: Unveiling the Drivers of Sustainable Consumption Patterns for a Greener Future

AUTHOR :

Ingale K.; Shirolkar S.; Jadhav B.

JOURNAL NAME:

Sustainable Investing: Navigating Environmental, Social, and Governance (ESG) Challenges and Opportunities

DETAILS:

Published on December 2025

ABSTRACT:

As environmental concerns continue to increase, green consumption, which emphasizes the development, marketing, and promotion of products based on ecological benefits, has gained importance. This study aims to examine the impact of green marketing measures on consumer behavior. It continues to explore the relationship between consumers' attitudes towards the environment and their actions towards the environment. In addition, this study also investigates the possibility of integrating green practices into daily life. This study delves into the multifaceted factors influencing consumer behaviors that favor sustainability, offering insights into how these behaviors can be fostered and amplified. This research identifies key motivators and barriers to sustainable consumption by analyzing socio-economic, cultural, and psychological determinants. The findings highlight the significant role of fostering consumer awareness and their engagement in societal and environmental preservation and the creation of supportive infrastructure using green marketing initiatives for the promotion of sustainable consumption. This study used Partial Least Squares Structural Equation Modeling to analyze data collected from 100 of the 112 participants at the beginning of the survey. The findings reveal novel insights, demonstrating positive influences of the perceived importance of green products, the identification of green goods, as well as branding and packaging on green consumerism. The model presents compelling evidence for encouraging consumer participation in environmental sustainability efforts. These results underscore the potential of green marketing strategies to foster environmentally responsible consumption behaviors.

Link: https://doi.org/10.2174/9798898811358125010015

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Regenerative Braking-Aware Longitudinal Slip Control Strategy for Hub Motor Electric Two-Wheelers on Variable Friction Surfaces

AUTHOR :

Deshmukh S.; Deshmukh S.; Lokhande N.

JOURNAL NAME:

2025 IEEE 4th International Conference for Advancement in Technology, ICONAT 2025

DETAILS:

Published on September 2025

ABSTRACT:

Natural Language Processing (NLP) has revolutionized how machines understand and generate human language, enabling applications from conversational AI to sophisticated machine translation systems. This comprehensive survey provides an in-depth review of NLP techniques, spanning from traditional rule-based methods to cutting-edge deep learning approaches, including transformer architectures and large language models (LLMs). We explore various neural network architectures, including Recurrent Neural Networks (RNNs), Long Short-Term Memory (LSTM) networks, Gated Recurrent Units (GRUs), and Convolutional Neural Networks (CNNs), along with embedding techniques such as word vectors and contextual embeddings. This study examines key applications across e-commerce, healthcare, and social media platforms, while addressing critical challenges, including data scarcity, algorithmic bias, and computational complexity. Through an analysis of over 100 recent publications (2020-2024), we highlight the current methodological trends and future research directions, emphasizing efficient model architectures and multilingual processing capabilities. This study serves as a comprehensive guide for researchers and practitioners navigating NLP's rapidly evolving landscape.

Link:
https://doi.org/10.1109/ICONAT66879.2025.11362672

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Natural Language Processing Driven Employee Feedback Analysis Framework for Engagement

AUTHOR :

Shaikh M.; Nandal N.; Verma V.K.; Mankar R.S.; Podipara A.G.; Shachie

JOURNAL NAME:

Proceedings of 2025 10th International Conference on Science Technology, Engineering and Mathematics, ICONSTEM 2025

DETAILS:

Published on February 2026

ABSTRACT:

The paper is a proposal to the Natural Language Processing (NLP)-Driven Employee Feedback Analysis Framework of Engagement that benefits Incremental Learning and Integration of Continuous Feedback. Its methodology uses Hugging Face Transformers to work with PyTorch to make real-time processing of the employee feedback possible. This method allows much reduced processing time to the extent of 40 percent, enhanced accuracy by 30 percent, and a 100 percent real-time adaptation, providing dynamic solution to organizations. The framework promotes employee engagement with improvement of 20 percent within three months through responsive enactment to the feedback. Although the consumption of resources doubles with increasing size of the datasets, the model is extremely scalable to deal with vast amounts of feedback. The results indicate the possibilities of NLP methods in changing employee engagement, offering practical implications to businesses that can refocus feedback and increase employee satisfaction flow.

Link:
https://doi.org/10.1109/ICONSTEM65670.2025.11374527

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Microwave Sintering of Biomaterials: Advances in Processing for Biomedical Applications

AUTHOR :

Gupta S.; Sharma A.K.; Sampath V.; Agrawal D.

JOURNAL NAME:

Materials Horizons: From Nature to Nanomaterials (Vol.-Part F 1709)

DETAILS:

Published on 1 April 2026

ABSTRACT:

Microwave-assisted material processing, an unconventional manufacturing technique, is widely explored for processing engineering materials, such as high-temperature ceramics and metals, as well as composites based on them. In processing of ceramics, it is predominantly used by the ceramic industry for the manufacture of different electronic devices (e.g., capacitors), apart from being used as hard tissues and porous medical devices/products by the medical industry. Shorter processing times, lower energy consumption, and eco-friendliness, together with enhanced properties of the product, make this technique being much sought after worldwide by researchers as well as manufacturers in the realm of materials for biomedical applications. These attractive characteristics, as well as advantages, make this technique more predominantly used by the healthcare sector. Over the years, research in diverse areas of the processing of bioceramics and biocomposites has been carried out worldwide to achieve improved properties and performance. In particular, microwave sintering is used to manufacture artificial biomaterials for dental and orthopedic implants. Microwave sintering can also be used to manufacture porous structures for tissue engineering and drug delivery systems with improved biocompatibility and healing performance. This chapter covers microwave sintering of biomaterials in detail, such as the different types of biomaterials that can be processed by this technique and the challenges that can be overcome so as to yield newer products in the future. In particular, this chapter highlights the use of microwave sintering for the manufacture of artificial biomaterials for diverse medical applications.

Link: https://link.springer.com/chapter/10.1007/978-981-95-4005-1_6

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Interpretable Machine Learning for Price Prediction in India's used Two-Wheeler Market using XAI Tools

AUTHOR :

Keer K.; Bhoite S.; Kanade A.S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-2)

DETAILS:

Published on July 2025

ABSTRACT:

The used two-wheeler industry has grown significantly in recent years, amid rising fuel prices, growing need for inexpensive transportation, and the swift rise of e-commerce, quick-commerce and delivery services. With this surge, accurate price prediction has become decisive for dealers, buyers, and digital platforms to certify fair and data-driven transactions. Machine learning algorithms such as Lasso and Ridge regression help model line-ar relationships while controlling overfitting through regularization. Decision Tree and Random Forest algorithms capture complex nonlinear patterns in the data, whereas XGBoost offers high performance and scalability for large datasets with its gradient boosting framework. To foster trust and transparency in these predictive models, the integration of eXplainable AI (XAI) tools is essential. SHAP- SHapley Additive exPlanations helps interpret model outputs by quantifying the contribution of each feature to the predicted price, this makes the decision-making process more visible and understandable to all stakeholders involved. Similarly, LIME - Local Interpretable Model-agnostic Explanations is an approach for explaining particular predictions across any ma-chine learning model by estimating them internally with a more accessible, simpler approach.

Link:
https://thegrenze.com/index.php?display=page&view=journalabstract&absid=5650&id=8

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Extensive Dataset Driven Hybrid Neural Networks for Protein Secondary Structure Prediction

AUTHOR :

Sontakke S.; Srivastava A.; Kshirsagar A.; Chanchlani A.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-2)

DETAILS:

Published on July 2025

ABSTRACT:

Protein secondary structure prediction (PSSP) is one of the oldest and most challenging problems in computational biology. Recently, modern machine learning and deep learning algorithms have been utilized to develop techniques for predicting the secondary structures of proteins. The proposed model was trained on an extensive dataset of 128,644 unique protein sequences, sourced from the Dictionary of Protein Secondary Structure (DSSP) [1][2]. The dataset was split into 70% for training, 10% for validation, and 20% for testing. Due to computational constraints, the maximum sequence length was limited to 256. The architecture includes an embedding layer to capture dense vector representations of amino acid sequences, multiple convolutional layers to identify spatial dependencies, a BiLSTM layer for capturing long-term dependencies, and a BiGRU layer for short-term dependencies, all processed through time-distributed dense layers and an output layer. Techniques like dropout and L2 regularization were used to avoid overfitting and improve generalization. The large scale and diversity of the dataset promoted us to design a slightly more complex architecture to adequately learn the intricate patterns in protein sequences. A custom metric – masked accuracy was defined to avoid inclusion of padding in accuracy calculations. This approach achieved a Q3 accuracy of 86.30%, showing that hybrid architectures are effective for PSSP.

Link:
https://www.scopus.com/pages/publications/105034839875?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Design and Evaluation of a VR-Based Interactive Property Tour System for Real Estate Applications

AUTHOR :

Saikhedkar U.; Mude G.

JOURNAL NAME:

Proceedings of 2025 10th International Conference on Science Technology, Engineering and Mathematics, ICONSTEM 2025

DETAILS:

Published on November 2025

ABSTRACT:

This paper introduces the design and assessment of a VR-Based Interactive Property Tour System as a means of improving the visualization of real estate and interaction with customers. It combines Z-Score Normalization to preprocess data, consistency of data to all metrics of user interaction, and Recursive Feature Elimination (RFE) to determine the most powerful behavioral and environmental variables that can influence the user experience. Gradient Boosting Machine (GBM) is a classifier that was built with the help of the TensorFlow software to predict the user engagement and their intentions to buy the product with a high accuracy. The experimental analysis shows that the accuracy of the system, spatial perception and the quality of interaction are considerably enhanced in comparison with the old models of virtual tours. The findings suggest the increased user satisfaction and lesser navigation latency, confirming the efficiency of the machine learning-immersive virtual reality combination. The presented research adds to the scalable, AI-powered intelligent property visualization, which is a more realistic, data-driven, and interactive solution to the modern real estate applications.

Link:
https://doi.org/10.1109/ICONSTEM65670.2025.11374707

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Enhancing Vehicle Rentals with AI: An Autonomous Deep Learning Framework

AUTHOR :

Raut U.; Baviskar D.; Salunkhe R.; Kokare A.; Bhagat D.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-2)

DETAILS:

Published on August 2025

ABSTRACT:

This paper presents an advanced web-based car rental platform built using the MERN (MongoDB, Express, React, Node.js) stack, designed to deliver a seamless, secure, and user-friendly experience. The platform features real-time vehicle availability tracking and an AI-powered Optical Character Recognition (OCR) system for vehicle authentication. By scanning the Registration Certificate (RC), the AI model ensures the legitimacy of listed vehicles, enhancing security and trust in the rental process. A standout feature of this platform is the 24/7 Emergency Driver Assistance (EDA) service, which enables renters who are unable to drive to request a professional driver, ensuring uninterrupted travel. This functionality enhances accessibility, making the platform particularly beneficial for users requiring additional support. By integrating secure user registration, AI-driven vehicle verification, real-time availability tracking, and on-demand driver assistance, the system optimizes safety, convenience, and reliability in modern car rentals, ultimately enhancing customer satisfaction and trust.

Link:
https://www.scopus.com/pages/publications/105034839079?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Brain Tumor Detection using Convolutional Neural Network

AUTHOR :

Mali S.M.; Garud A.; Suri S.S.; Monpara H.; Sharma M.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-2)

DETAILS:

Published on 2025

ABSTRACT:

This is a very important, but simultaneously a rather difficult job to perform, the segmentation of brain tumors in medical imaging. When training models with human-made labels to make predictions, then wrong judgments will arise. Another difficulty is that there is too much data but one is added to an unpleasant chore. In that vein, it should be well realized that as work it should go out right! The challenge is that while brain tumors seem highly diverse, they share general features, and are distinct from normal tissues as well as each other, removing them off images. A Brain Tumor extraction technique is adopted in this paper. It is initialized from 2D Magnetic Resonance brain Images (MRI), and the fuzzy C-means clustering algorithm is used. Then we have classifiers both in conventional and deep learning approaches. In the experiment being described, the training data is similar to a live dataset containing complicated tumor sizes, shapes, positions, and intensity images respectively. In the classifying stage of the classic distinction, we will use these six stand-by classifiers: SVM, K-Nearest neighbor (KNN), multilayer perception (MLP), logistic regression, naïve Bayes, and random forest, all of which are implemented in scikit-learn. Then we try to use the Convolutional Network (CNN), although it isn't the traditional one. The selection is Keras + Tensorflow, only because it has better performance than previous ones. CNN performed 97.87% on our dataset and is extremely promising. Normal pixels and abnormal pixels are compared in this paper using texture-based and statistical-based features. Brain tumors are characterized by high diversity of appearances and are extremely similar to surrounding normal tissues, thus it's impossible to identify regions with them. We present a new algorithm for segmentation of brain tumor from two-dimensional magnetic resonance images of living human beings (MRI) wherein first the fuzzy C-Means clustering algorithm is applied followed by some conventional classifiers and neural networks.

Link:
https://www.scopus.com/pages/publications/105034864376?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Novel hydrophobins Hydph6, Hydph7, and Hydph16 from Pleurotus ostreatus: In silico characterization reveals Hydph6 chitin affinity and industrial potential

AUTHOR :

Kulkarni S.S.; Dani A.; More A.; Kudagi S.; Turkar S.

JOURNAL NAME:

Journal of Applied Biology and Biotechnology (Vol.-14, Issue-2)

DETAILS:

Published on 25 January 2026

ABSTRACT:

Hydrophobins (HPs) are industrially important small surface-active proteins mostly found in fungi. In this study, new hydrophobins were detected and identified from the edible white rot mushroom Pleurotus ostreatus (GRAS strain) using a proteomic approach. HPs Hydph6, Hydph7, Hydph16, Vmh2, and Vmh3-1 were detected together after separation of the membrane proteins of P. ostreatus mycelia. Identification of Hydph6, Hydph7, and Hydph16 were reported for the 1st time in Orbitrap-HR-LC-MS/MS analysis, and the primary amino acid sequences were annotated. This study is the first report of protein-level identification and extensive in silico characterization of Hydph6, Hydph7, and Hydph16. Computational tools were used to characterize these selected HPs. ProtParam and ProtScale studies confirmed Vmh2 and Hydph6 as promising candidates for industrial applications with a high value of the grand average of hydropathicity index (0.662 and 0.996, respectively) and aliphatic index (112.11 and 122.07). Modeller 9.11 was used to obtain the most accurate three-dimensional structures of all HPs. Among all the proteins, the Z-score values and Ramachandran plot analysis of Vmh2 and Vmh3-1 suggested that the structures of these proteins were more closely aligned with existing databases of previously derived structures of HPs in comparison to other HPs. Protein– protein interaction studies showed promising interaction of Hydph6 and Vmh2 with most of the proteins involved in cell division and development, of P. ostreatus, in a way that these proteins play an important role in the growth cycle of P. ostreatus. These proteins did not show transmembrane regions and were not glycosylphosphatidylinositol (GPI)-anchored.

Link: https://dx.doi.org/10.7324/JABB.2026.262732

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Quality of service driven energy-efficient computing to enhance sustainable cloud

AUTHOR :

Sharma C.; Kumar A.; Tiwari P.K.

JOURNAL NAME:

Array (Vol.-30)

DETAILS:

Published on April 2026

ABSTRACT:

In this research, a novel hybrid method is introduced that combines Coati and Gazelle Optimization algorithms to enhance the management of virtual machines (VMs) in Cloud Computing (CC). The goal is to reduce energy usage and prevent server overload by optimizing VM placement. Our approach balances exploring new options with refining existing solutions. The method is tested the method using CloudSim, and the results demonstrate improved performance compared to existing techniques, particularly in energy savings, reduced system slowdowns, and smoother workload handling. CC has become a leading on-demand platform, allowing users to store and access data anytime under a “pay as you go” model. However, the high volume of user requests increases energy consumption, negatively impacting Quality of Service (QoS). Existing research has mainly focused on either QoS or energy efficiency to enhance user experience. To address this, a hybrid approach is employed that integrates Coati with Gazelle optimization to combine QoS and energy efficiency in a cloud environment. The focus is on improving infrastructure performance through resource allocation, workload scheduling, and VM placement while minimizing operational costs and energy consumption through workload adaptation and dynamic resource management. Improved energy efficiency leads to decreased energy consumption and enhanced QoS when users receive timely responses from cloud providers. The three methods is utilized: an energy-aware VM selection policy, EQ-VMC, and the proposed hybrid Coati with Gazelle optimization. These methods are compared using performance metrics such as migration time, throughput, reliability, energy efficiency, and QoS. The proposed model achieves higher performance than the other two methods, making it a valuable solution for effective cloud system management. The Hybrid Coati with Gazelle Optimization has attained the reliability as 98.30 %, scalability as 90.44%, throughput as 99.05% and availability as 98.18%.

Link: https://doi.org/10.1016/j.array.2026.100790

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

The convolute stress behavior analysis in piping expansion joints under internal pressure

AUTHOR :

Gulumkar A.P.; Pagar N.D.; Joshi A.V.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3344, Issue-1)

DETAILS:

Published on 9 April 2026

ABSTRACT:

This paper aims to investigates the convolute stresses acting on piping extension joint through an experimental and analytical approach. Piping expansion joint are essential component in numerous industrial applications, design to accommodate thermal expansion, vibrations and other dynamic loads in piping system used in refineries, thermal plants and its components, as well as in various heat exchangers. Understanding the convolute behavior experienced by compensators is necessary for ensuring their structural integrity and optimal performance and useful for predicting the stress-based cycle life. Initially, the stresses are calculated using an analytical expression from the expansion joint manufacturing association manual (EJMA). After that, utilizing an experimental test rig in which an expansion joint is exposed to an internal pressure, various EJMA stress analysis has been conducted and subsequently compared. The outcomes of this investigation will make a valuable contribution towards augmenting the efficiency of piping systems through the assurance of dependable compensator performance. The utilization of validated analytical models can facilitate predictive analysis which in turn can enable engineers to optimize compensator design and mitigate potential risks of failure. In essence, this study provides backing for the progression of engineering methodologies and adds to the general reliable and structural integrity of industrial pipeline structures.

Link: https://doi.org/10.1063/5.0318140

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Dermascopic and non-Dermascopic image classification using deep learning

AUTHOR :

Betgeri S.; Ashtagi R.; Bidwe R.; Surdas S.; Khan S.; Kasurde S.; Sakpal R.

JOURNAL NAME:

Connecting Intelligence: Trends in Computation and Data Communication

DETAILS:

Published on 17 February 2026

ABSTRACT:

Skin cancer, especially melanoma, is a serious threat to global health, with millions of new cases and considerable mortality each year. Early detection of cancerous lesions significantly improves patient outcomes, so the need for accurate diagnostic tools is evident. This work introduces a deep learning framework designed to classify dermoscopic images into malignant or benign categories. Our approach uses the architectures of MobileNetV2 and VGG-19 to obtain a classification accuracy of 94.06% on the ISIC dataset containing more than 10,000 dermoscopic images. For greater reliability, we apply intensive preprocessing techniques, such as data augmentation and balancing, for class imbalance mitigation. Apart from this we also worked on the ISIC 2024 3D TBP dataset, which is a dataset of non-dermascopic images that resemble close-up smartphone-like images, unlike the dermascopic dataset. We implemented an EfficientNetB0 model on this dataset to predict benign or malignant lesions. This proposed solution I adaptive and aims to work for both dermascopic as well as non-dermascopic images, thus providing a broader solution and includes mechanisms for providing feedback to enable continuous improvement. This project has, therefore, demonstrated high efficacy in transforming dermatological diagnostics and reducing cancer-related mortality rates, possibilities of deep learning for such applications

Link: https://doi.org/10.1201/9781003773504-120

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Experimental investigation of a sustainable natural convection solar air dryer with an internally ringed finned tube

AUTHOR :

Nayak R.C.; Kulkarni M.V.; Behera V.M.; Shende P.N.; Shekar K.

JOURNAL NAME:

Environmental Progress and Sustainable Energy

DETAILS:

Published on 24 April 2026

ABSTRACT:

The purpose of this study is to design, fabricate, and experimentally evaluate a sustainable natural convection solar air heating system suitable for passive drying and heating applications without the use of auxiliary power sources. A natural convection solar air heater was developed using a rectangular wooden enclosure integrated with a circular tube fitted with internally placed triangular cross section rings to enhance heat transfer and air mixing. A thin aluminum plate supporting a black coated V shaped absorber was positioned above the tube to effectively capture solar radiation. A transparent glass cover was used to minimize convective and radiative heat losses. Experiments were conducted under inlet air temperatures of 28–32°C and solar radiation intensities ranging from 610 to 950 W/m2. Key parameters such as tube surface temperature, outlet air temperature, buoyancy driven mass flow rate, and instantaneous thermal efficiency were evaluated. The results show that the internally ringed finned tube significantly enhances convective heat transfer compared to a smooth tube due to improved turbulence and secondary flow formation. The natural convection mass flow rate increased by approximately 25–30%, while the maximum temperature rise between inlet and outlet air ranged from 18 to 22°C under peak solar radiation. A maximum instantaneous thermal efficiency of about 46% was achieved at peak solar irradiance of 950 W/m2.

Link: https://doi.org/10.1002/ep.70464

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

CipherStack: A Dual-Layered Encryption Architecture Using Historical Rotor Logic and Polymorphic Encoding

AUTHOR :

Patil K.; Gutte V.S.; Gunale K.

JOURNAL NAME:

Proceedings of 10th International Conference on Communication and Electronics Systems, ICCES 2025

DETAILS:

Published on October 2025

ABSTRACT:

This paper proposes CipherStack, a dual-layer encryption architecture that serially combines an Enigma-inspired rotor stage with a session-mutating polymorphic software stage to harden low-resource IoT links against brute-force, frequency, and pattern attacks. A working ESP32 prototype with servo-emulated rotors and a Python polymorphic encoder achieved bit-exact end-to-end recovery while maintaining latency acceptable for short, intermittent sensor messages on constrained links. Measured security proxies showed average avalanche change of ≈ 30% for one-bit flips, NPCR ≈ 95.5%, UACI ≈ 3.4%, and simulated IND-CPA success ≈ 50%, indicating correctness and pattern disruption with clear headroom for authenticated encryption and stronger diffusion in future iterations. Contributions include a modular hybrid design, a synchronized key/rotor workflow, an IoT-class implementation, and a security evaluation matrix to guide quantitative testing and tuning. The prototype and analysis demonstrate feasibility for local IoT messaging, embedded education, and defense-in-depth designs that mix physical state evolution with adaptive transforms on constrained devices.

Link: https://doi.org/10.1109/ICCES67310.2025.11336308

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Safeguarding the Future of Marketing: Security Considerations in XR, AR, and the Metaverse

AUTHOR :

Sharma S.; Sane A.C.; Behare N.; Mohture A.

JOURNAL NAME:

The Strategic Evolution From Omnichannel to Metachannel Marketing

DETAILS:

Published on October 2025

ABSTRACT:

As marketing rapidly evolves through immersive technologies such as XR, AR, and the Metaverse, it introduces new dimensions of engagement—along with unprecedented privacy and security challenges. This chapter examines how immersive marketing collects biometric, behavioral, and spatial data, and identifies critical vulnerabilities such as identity spoofing, data overreach, and consent ambiguity. It analyzes legal and ethical blind spots, evaluates security frameworks like Zero Trust and Privacy-by- Design, and presents industry case studies that demonstrate secure implementation. Through forward-looking recommendations, the chapter aims to equip marketers, technologists, and policymakers to build immersive experiences that are not only engaging, but also ethically and securely grounded.

Link: https://doi.org/10.4018/979-8-3373-4591-8.ch013

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Forming Limit Curves Analysis Of Thin Nickel 200 Biomaterial Foils: Experimental Insights; [Анализ Кривых Предельного Формоизменения Тонких Пластин Из Биоматериала Nickel 200: Экспериментальные Данные]

AUTHOR :

Sanghavi N.; Shirodkar I.D.; Kulkarni O.; Kakandikar G.

JOURNAL NAME:

Russian Journal of Biomechanics (Vol.-30, Issue-1)

DETAILS:

Published on 2026

ABSTRACT:

The forming limit curve is a feature of the material that represents the limiting strains that lead to failure of the necking with respect to the direction of deformation strain. It displays the ductile damage & onsite necking failure limits, thickening of metal sheets that are very thin. Fewer than 100 microns, is challenging and demands greater accuracy. Micro-forming is the term used to describe this kind of miniaturisation in the forming process, which produces components with dimensions as small as a few millimetres. When a macro process is transformed into a micro process, there are significant variations in the physics of the process and the characteristics of the materials. In order to identify the forming limit curves, an experimental test on a thin Nickel 200 sheet with a 50 m thickness was conducted with varied orientations to rolling directions (0o, 45o, and 90o). According to the test standard ASTM-2218-14, the hemispherical microform punch test is performed using uniaxial, intermediate-uniaxial, biaxial and plane strain specimens to determine the strains. Experimental values have been used to validate numerical findings. Numerical analysis is used to model the micro-forming process, and forming limit curves are shown. Numerical results have been validated using experimental observations.

Link:
https://www.scopus.com/pages/publications/105034944916?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Stability of Gut Microbiome Profiles: Effects of Storage Conditions and Preservation

AUTHOR :

Bokey N.; Harle S.; Joy J.

JOURNAL NAME:

2025 2nd International Conference on Integration of Computational Intelligent System, ICICIS 2025

DETAILS:

Published on September 2025

ABSTRACT:

The Gut microbiome analysis consider as a diagnostic and precision medicine tool for life style and gastrointestinal diseases. The accurate analysis of gut microbiota composition is dependent on the stability and integrity of the stool sample right from the point of collection to the downstream processing (sequencing). Post collection variables, such as storage conditions, preservation strategies are said to influence the structure of microbial community and also influence the diversity profiles. This will lead to hinderance in the reliability of microbiome studies. This study puts forth an evaluation of the functionality of two common preservation strategies with respect to stool sample collection- first is cold storage and second is the buffer based chemical preservation. The influence of these methods on the stability of gut microbiota profiles is analyzed with the help of metagenomic approach. The stool samples were collected from healthy individuals and preserved under both cold storage and buffered conditions, before proceeding towards DNA extraction and sequencing. For analyzing the diversity of the microbiome profile, Alpha diversity was computed to asses sample richness and evenness, between and within the samples. The study highlights the importance of selecting the optimal preservation strategy in order to maintain the fidelity and reproducibility of gut microbiome analysis.

Link: https://doi.org/10.1109/ICICIS65613.2025.11371281

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Agricultural Automation System to Measure Soil Moisture and NPK Values using IoT

AUTHOR :

Pujeri O.; Chavan V.; Kumar A.; Balpande A.; Sugave S.; Pujeri U.; Polishettiwar S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-2)

DETAILS:

Published on 17 November 2025

ABSTRACT:

Real-time monitoring of soil temperature and soil moisture plays a vital role in agricultural automation. By deploying sensors in key locations within greenhouses or fields, farmers can collect and analyse data instantly. This real-time information allows for informed decisions regarding moisture level in soil, soil temperature, crop yield prediction ans other aspects of crop management, ultimately enhancing crop yields and ensuring plant vitality. Agriculture is a fundamental industry that continually evolves, driven by technological innovations aimed at optimizing crop production and maintaining plant health. Soil temperature and soil moisture are critical factors influencing plant growth; extreme less soil moisture and high soil temperature can stress plants and diminish the quality of the crops. Therefore, monitoring these parameters in real time is essential for fostering optimal growth and health. Objective: Objective of this research is real time monitoring of soil moisture and soil temperature using sensors for better crop growth and better crop yield Methodology: This research paper elucidates the design, creation, and assessment of a soil moisture and temperature sensor system employing Arduino microcontroller technology. The system is engineered to furnish precise and real-time monitoring of soil conditions, thereby facilitating agricultural management practices. Utilizing capacitive soil moisture sensing and temperature sensing techniques, the sensor system aims to measure soil moisture content and temperature accurately. Outline: The paper outlines the hardware design, software implementation, and experimental findings to underscore the efficacy and dependability of the proposed sensor system.

Link:
https://www.scopus.com/pages/publications/105034844543?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Hybrid physics-informed neural networks and analytical framework for breathers and rogue waves in low-amplitude photorefractive media

AUTHOR :

Ripai A.; Katti A.; Abdullah Z.

JOURNAL NAME:

Physica Scripta (Vol.-100, Issue-11)

DETAILS:

Published on November 2025

ABSTRACT:

We integrate physics-informed neural networks (PINNs) with an analytical framework based on the NLSE-NLSE transformation to investigate the dynamics of Akhmediev breathers (ABs) and rogue waves (RWs) in low-amplitude photorefractive media, corresponding to the low photorefractive nonlinearity regime. Exact AB solutions are derived via the NLSE-NLSE transformation and used as prototypes to generate first-order RW solutions. PINN-based validation confirms the accurate reproduction of both solutions and their dynamical features, with minimal errors. Modulation instability analysis uncovers the mechanism driving the AB-RW transition in this low-amplitude regime. At the same time, electro-optic parameters enable independent control of AB oscillation frequencies and RW localization, while the medium's response time governs amplitude damping and temporal dynamics. We also identify how PINN architectural complexity affects prediction accuracy through error analysis. Beyond introducing a hybrid PINN-analytical framework, this work elucidates fundamental aspects of extreme wave dynamics in photorefractive systems.

Link: https://doi.org/10.1088/1402-4896/ae1559

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A Novel Extension of Akash Distribution: Properties, Simulation and Applications

AUTHOR :

Rather A.A.; Mohiuddin M.; Alotaibi E.S.; Qayoom D.; Saraja D.V.; Metkewar P.S.; Dar S.A.

JOURNAL NAME:

Lobachevskii Journal of Mathematics (Vol.-46, Issue-11)

DETAILS:

Published on 5 April 2026

ABSTRACT:

This paper presents a novel generalization of the Akash distribution using the Alpha Power Transformation method, enhancing its flexibility and applicability in statistical modeling. The proposed distribution is systematically examined through an in-depth analysis of its key properties, including moments, skewness, kurtosis, and reliability measures. Its ability to effectively capture skewed data patterns makes it a valuable addition to the family of generalized distributions. Parameter estimation is conducted using both the maximum likelihood and least squares methods to ensure robust inference. The superiority of the proposed model is demonstrated through extensive empirical validation using real-world datasets from medical sciences, where it consistently outperforms existing distributions in terms of goodness-of-fit criteria. The findings underscore the broader applicability of the new distribution in various scientific and engineering domains, offering a powerful tool for researchers and practitioners dealing with asymmetric data.

Link: https://doi.org/10.1134/S1995080225609683

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Gabor-ViT: A Parameter-Efficient Multi-Stream Vision Transformer for Remote Sensing Scene Classification

AUTHOR :

Shinde V.R.; Chaudhuri A.; Chandra A.; Patil H.Y.; Shinde V.; Karthikeyan B.

JOURNAL NAME:

Proceedings of 2025 International Conference on Signal Processing, Computation, Electronics, Power and Telecommunication, IConSCEPT 2025

DETAILS:

Published on December 2025

ABSTRACT:

Remote Sensing Scene Classification (RSSC) is a pivotal challenge in Earth observation; however, the complete retraining of massive foundation models like Vision Transformers (ViTs) is frequently computationally impractical. To address these limitations, we propose Gabor-ViT, a novel and parameter-efficient multi-stream architecture that combines classical Gabor filters with a modern ViT backbone. Our method enriches the input to a frozen ViT by generating parallel data streams - one with the original RGB image and two derived from a Gabor filter bank - to explicitly capture textural and directional features. For adaptation, we employ (IA)3, a lightweight parameter-efficient fine-tuning (PEFT) technique that modifies a minimal subset of parameters by rescaling internal activations. We evaluate our approach on benchmark dataset using a stratified 80:20 traintest split. Gabor-ViT achieves a competitive accuracy of 97.45% on the AID dataset. These results demonstrate that Gabor-ViT provides an effective and computationally efficient solution for RSSC, achieving high performance while drastically reducing the number of trainable parameters.

Link:
https://doi.org/10.1109/IConSCEPT66142.2025.11436261

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A comprehensive review of deep learning techniques for advancing Alzheimer's disease detection

AUTHOR :

Kaskar S.; Kinger S.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3369, Issue-1)

DETAILS:

Published on 18 March 2026

ABSTRACT:

Alzheimer's disease (AD) is a neurological disorder that worsen over time, causing memory loss and cognitive impairment. Early detection is key to effectively preventing Alzheimer's disease and improving patient outcomes. This paper explores the application of Convolutional Neural Networks, Generative Adversarial Networks, and Explainable Artificial Intelligence in the early detection of Alzheimer's disease. By conducting a comprehensive literature review, this paper aims to summarize the current state of Artificial Intelligence technologies in Alzheimer disease detection, focusing on datasets, data processing techniques, model architectures, and evaluation metrics. The goal is to provide a thorough understanding of how these advanced Artificial Intelligence methodologies can maximize the level of accuracy and interpretability of Alzheimer's disease diagnostics.

Link: https://doi.org/10.1063/5.0317617

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Thermal and hydraulic performance evaluation of a modified circular leaf type receiver for solar tower systems

AUTHOR :

Kulkarni K.G.; Tamkhade P.K.; Nalavade S.P.; Gurav R.B.; Mundra S.S.; Joshi S.P.

JOURNAL NAME:

Heat and Mass Transfer/Waerme- und Stoffuebertragung (Vol.-62, Issue-5)

DETAILS:

Published on 11 April 2026

ABSTRACT:

Heliostats concentrate solar radiation onto a central receiver in solar tower systems; however, conventional receiver designs often suffer from limited thermal power output, efficiency, and operational stability. To address these limitations, this research introduces a Modified Circular Leaf Type Solar Receiver with an optimized geometric configuration aimed at enhancing thermal performance, minimizing hydraulic losses, and improving overall energy utilization. The study combines computational fluid dynamics (CFD) simulations using ANSYS®16 with laboratory-scale experiments to provide a detailed thermofluidic and thermodynamic evaluation. A comparative analysis is performed between the proposed design and conventional receivers, including conical, cylindrical, and billboard types, under varying solar flux intensities (1000–3000 W/m2) and mass flow rates (0.1–1.0), using water as the heat transfer fluid. In addition to thermal performance, exergy analysis is conducted to evaluate system irreversibility, determine the quality of energy conversion, and identify regions with maximum exergy destruction. It is important to note that the study focuses on comparative thermofluidic assessment under low-to-moderate heat flux conditions rather than full-scale concentrated solar power (CSP) tower operation. The results demonstrate that the proposed receiver achieves a maximum thermal efficiency of up to 95%, representing an improvement of 16–51% over conventional designs at lower flow rates (0.1–0.6). Additionally, a reduction in pressure drop of approximately 12% is observed, along with a peak power output of 0.09 kW. The reported efficiency corresponds to receiver-level heat absorption under controlled laboratory conditions, excluding heliostat and atmospheric losses, indicating enhanced thermodynamic performance for practical applications.

Link: https://link.springer.com/article/10.1007/s00231-026-03678-5

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Moisture Measurement and Analysis Using Bilateral Slotted Rectangular Microstrip Antenna

AUTHOR :

Patel V.; Chaware T.; Diwan K.; Kaur I.; Sartaj H.; Warhade K.

JOURNAL NAME:

2025 2nd IEEE International Conference for Women in Computing, InCoWoCo 2025

DETAILS:

Published on November 2025

ABSTRACT:

A Microstrip patch antenna of dimensions 13.86mm x 18.24mm x 0.0005mm on a substrate FR4 Epoxy of dimension 30mm x 30mm x 1.6mm with slots of 2.5mm x 1.5mm on the two lateral sides is designed at 5 GHz. This proposed design is utilized as a moisture sensor based on the antenna's backscattering characteristics. Here, the microstrip patch antenna is intended to be used as a moisture sensor and tested for different materials like rice, pulses, soil, salt, and sugar. The water content is gradually raised for a fixed quantity of sample, keeping the distance between the designed bilateral slotted rectangular microstrip antenna and the sample constant. Subsequently, the magnitude of S11 is measured using a vector network analyzer. The pattern of the magnitude of S11 with increasing water quantity is noted to be different for samples, e.g. for salt, sugar and rice, it is noticed that with the increase in water level, i.e. moisture content, the magnitude of S11 becomes more negative indicating strong return loss, whereas for pulses, and soil, with an increase in moisture content, the magnitude of S11 becomes less negative indicating weaker return loss. This uniquely designed bilateral slotted rectangular microstrip antenna operates at 5 GHz, achieving reflection coefficients of - 25.54 dB and -22.79 dB, and standing wave ratios of 0.9440 and 1.099 in simulations and measurements, respectively. Its efficient design facilitates the sensing of moisture levels in 25gm samples of salt, soil, and rice, as well as 50gm samples of sugar and pulses, demonstrating its practical utility in moisture detection applications.

Link:
https://doi.org/10.1109/InCoWoCo68239.2025.11406991

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Advancing Road Safety: A Comprehensive Approach through Enhanced Road Detection Systems

AUTHOR :

Thorat A.; Suryawanshi K.; Gupta R.; Idhate S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

Enhanced Road Detection (ERD) stands as a groundbreaking endeavor at the intersection of computer vision and deep learning, aimed at revolutionizing road safety and traffic management in modern transportation systems. This research paper explores the pivotal role of ERD in addressing critical issues plaguing road networks worldwide through the integration of advanced computer vision techniques, such as object detection and image analysis. ERD endeavors to identify and classify various road elements with unprecedented accuracy and efficiency. The core objectives of ERD encompass enhancing lane detection capabilities, identifying road hazards like potholes, recognizing zebra crossings, and accurately detecting traffic signals. The project utilizes advanced techniques, such as the You Only Look Once (YOLO) object detection algorithm, to enhance safety in the face of increasingly complex and congested road networks.

Link:
https://www.scopus.com/pages/publications/105034065120?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Exploring the Effectiveness of Hybrid Fiber-Reinforced Geopolymer Concrete

AUTHOR :

Sathe S.; Wadki V.; Shekokar S.; Khungar H.; Biswas A.

JOURNAL NAME:

Journal of Structural Design and Construction Practice (Vol.-31, Issue-3)

DETAILS:

Published on 26 March 2026

ABSTRACT:

This paper presents an experimental study evaluating the mechanical and durability properties of plain, steel fiber (SF), and polypropylene fiber (PPF) reinforced industrial fly ash (IFA)-based geopolymer concrete (GPC) and compares the results with those of ordinary Portland cement-based conventional concrete (CC). The incorporation of fibers in GPC resulted in a gradual reduction in workability, with slump values decreasing from 130 to 70 mm across GPC mixes. However, significant improvements were observed in mechanical properties. Compressive strength increased from 34 MPa in CC to a maximum of 46 MPa in the hybrid mix (GPC8). Likewise, notable enhancements in split tensile strength (7.90 MPa) and flexural strength (10.10 MPa) were achieved in GPC8, highlighting the synergistic effect of hybrid fibers in improving postcracking behavior. The modulus of elasticity also improved substantially, with GPC8 reaching 50.20×103 MPa compared to 24.60×103 MPa in CC. The GPC specimens demonstrated superior durability compared to the CC specimens. GPC showed 25% lower wear in abrasion tests, which improved to a 60% reduction with the addition of SF and PPF. In acid resistance tests, GPC exhibited less than 2.26% weight loss and a maximum 22.50% reduction in compressive strength after 6 months in 3% H2SO4. Both GPC and CC showed less than 1% weight loss under sulphate attack. Under wet-dry cycles in a marine environment, GPC maintained durability, with mass loss and strength reduction not exceeding 5.26% and 23.83%, respectively. The optimum percentage of SF, PPF, and a combination of hybrid fiber specimens was 0.4% PPF, 1% SF, and 0.4% PPF+1.0% SF, showing improvement in mechanical properties and durability properties over CC of the same grade. Scanning electron microscopy (SEM) and x-ray diffraction analyses were consistent with the observed mechanical and durability results. Furthermore, SEM images revealed a dense microstructure and a well-integrated interface between the GPC matrix and the fibers.

Link: https://doi.org/10.1061/JSDCCC.SCENG-2059

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

A Comprehensive Study on Olympic Data Analysis for Predicting Performance Trends using Machine Learning Algorithm

AUTHOR :

Raval S.; Mavani A.; Munde S.; Panchal R.; Wankhade S.; Sakarkar G.

JOURNAL NAME:

Proceedings of 5th International Conference on Ubiquitous Computing and Intelligent Information Systems, ICUIS 2025

DETAILS:

Published on November 2025

ABSTRACT:

The Olympic Games during their 120 years history furnishes a large mass of facts which recording the athletic victories as the sports development follows countries participation statistics. The study takes advantage of machine training to analyze previous Olympics performances that assist in creating medallion winning prediction. A dataset composed of 271,000 records containing 53 sports events and 306 attended by 207 countries and 7 significant statistical characteristics supports this study. Random Forest and are applied in the analysis XGBoost classifiers in order to create a predictive model. The Random Forest model provided accuracy of 86.9% at its first stage but its class imbalance minimized the prediction of the winner's issue. XGBoost classifier was shown to be better generalization performance although it decreased in level of accuracy 86.4%. Applying Synthetic Minority Over-Sampling Technique the prediction was enhanced by (SMOTE) on the software system accuracy of medal winners. XGBoost model that was constructed with numerical scaling and categorical encoding and feature scaling and temporal feature extraction achieved a rate of accuracy of 87% and accuracy scores of 0.91 and 0.49 of non-medalists and medalists respectively that defined a best precision recall balance. The trend analysis analysis with the historical trend and competition changes results in improved strategic sport analytics in coming up with better strategic decisions. Research results show machine learning is also a potent solution to sports analytics because it creates data-driven ways of athlete performance assessment and enhances future prediction of the Olympic events accuracy.

Link: https://doi.org/10.1109/ICUIS67429.2025.11380487

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Interpretable PM2.5 Forecasting in Pune using Classical and Quantum Machine Learning: A Comparative Study with SHAP Analysis

AUTHOR :

Patwardhan C.; Bhoite S.; Joshi S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (vol.-2)

DETAILS:

Published on August 2025

ABSTRACT:

Accurate and interpretable forecasting of PM2.5 concentrations is critical for managing air quality and protecting public health in urban areas. We propose a noise resilient hybrid quantum classical architecture for PM 2.5 forecasting, integrating quantum feature embedding with classical neural networks. Unlike prior work, our methodology combines SHAP based interpretability with quantum circuit optimization, enabling transparent analysis of quantum model decisions. Experimental results demonstrate that our hybrid model achieves 15.32 μg/m3 MAE (vs 8.03 μg/m3 for classical models) while using 80% fewer parameters, establishing a foundation for scalable quantum-enhanced environmental monitoring. This work introduces three key innovations: (1) First application of SHAP to quantum models in air quality prediction, (2) Parameter-efficient quantum-classical integration validated on real-world urban data, and (3) Noise-aware training protocols for NISQ-era devices."

Link:
https://thegrenze.com/index.php?display=page&view=journalabstract&absid=5652&id=8

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Investigation on the convolute dynamic behavior of automotive exhaust bellows

AUTHOR :

Thorat P.A.; Pagar N.D.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3369, Issue-1)

DETAILS:

Published on 18 March 2026

ABSTRACT:

The automotive exhaust bellows functions as an elastic vessel, effectively absorbing the vibrations produced by the engine and the thermal expansion resulting from the heated air of the exhaust system. It is crucial to understand that the entire exhaust pipe shakes in its absence. It mitigates the chance of costly manifolds and downpipe fractures, while also prolonging the lifespan of the complete exhaust system and its components. The exhaust bellows also assists in mitigating small pipe alignment discrepancies. The specific tractor exhaust system demonstrates that the bellows attachment is a continuous configuration with one end fixed and the other end free for expansion, or both ends fixed. Thus, dynamic features, including frequencies and modal behavior, are highly significant, as this component also alleviates external vibrations or excitations. Installing space for vehicle exhaust systems is constrained; therefore, it must be optimized concerning the system's durability and configuration. Hence, it is important to analyze the geometries QW & QDT are the non-dimensional factors as per EJMA and depends on parameters q, Dp & tp, H and incorporates curvature effect. The loading conditions are fluctuating, intermittent and vibrational failures, its modes and frequencies continuously changing. In such situations without reaching the deformation limit in elastic zones, corrugations become inactive and non-functioning. In this work, parametric analysis is done by experimental design through Taguchi approach and further natural frequencies are analyzed in both the boundary conditions specified and inferences are drawn. In the process of evaluating Ka, H, and tp, which has a significant impact on stiffness of the automotive exhaust bellows.

Link: https://doi.org/10.1063/5.0318137

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Optimization of Ocimum sanctum-Mediated Tranilast-Loaded Silver Nanoparticles in a Thermosensitive PDLLA-PEG-PDLLA Hydrogel: Green Synthesis, Characterization, and Cytotoxic Efficacy Against Triple-Negative Breast Cancer Cells

AUTHOR :

Ram S.; Pawar A.T.; Tagalpallewar A.A.; Baheti A.M.

JOURNAL NAME:

Journal of Pharmaceutical Innovation (vol.-21, Issue-4)

DETAILS:

Published 14 April 2026

ABSTRACT:

Triple negative breast cancer (TNBC) is aggressive subtype of breast cancer and has minimal treatment therapy. In the present work, we have developed a green and environmentally friendly synthesis of, Tranilast loaded silver nanoparticle (TRL-AgNPs), using an aqueous leaf extract of Ocimum sanctum (Holy Basil) as the capping, stabilizing and reducing agent. The prepared formulations were optimized by employing Box–Behnken design (BBD) via Design-Expert® software to obtain an ideal formulation (Run 14) with particle size 100.56 ± 4.12 nm, zeta potential − 28.21 ± 1.13 mV and entrapment efficiency 87.6 ± 3.5%. Additionally, these TRL-AgNPs were integrated into a triblock thermosensitive polymeric PLEL hydrogel which shows sol-gel transitional behaviour. with a sustained release of drugs of approximately 90% during 14 days. For characterization UV-Vis, DLS, XRD, TEM, SEM and zeta potential were used to ascertain the stability and structural integrity. In vitro cytotoxicity studies on on MDA-MB-231 cells demonstrated dose-dependent response with the IC50 of 54.09 µg/mL of TRL-AgNPs-HG mediated through the apoptosis, and G1/S phase cell cycle arrest. The hydrogel based delivery system facilitated local delivery while reducing acute cytotoxicity. These results indicate that there is a potential of a promising biocompatible platform for targeted TNBC therapy offering increased efficacy and reduced systemic toxicity.

Link: https://doi.org/10.1007/s12247-026-10516-y

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Flood Detection with UAV Imagery using Embedded AI

AUTHOR :

Chaudhari P.; Jadhav S.N.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

One of the most significant natural disasters, floods yearly cause significant harm to infrastructure, homes, and the economy. It is essential to develop a system for quickly determining the degree of flooding. Although satellite remote sensing has been helpful in emergency situations, its usefulness is restricted by long revisit periods and subpar performance in cloudy or rainy weather. Unmanned aerial vehicle (UAV) systems have gained popularity recently for monitoring disasters and navigating challenging situations. In order to improve flood detection systems and enable prompt reaction, this work leverages the Embedded AI technology to process data directly on microcontroller. To increase the precision and efficacy of flood detection operations, this platform also facilitates the creation of AI models that are specifically suited to local variables. In order to map areas with flooding of both visible and subsurface vegetation, the proposed method integrates random forest and region growth methodologies, leading to a more comprehensive flood detection system. The embedded platform utilizes the STM32F411RE microcontroller, and a dataset comprising a total of 644 UAV images is employed, with 544 images used for training the AI model and the remaining 100 images used for testing. The results show a test accuracy of 90.00%.

Link:

https://www.scopus.com/pages/publications/105034117447?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

A YOLO and CNN based Approach to Detect and Classify Diseases in Apple Plant Leaves

AUTHOR :

Kulkarni Y.; Phadke A.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

The agricultural sector plays a pivotal role in sustaining human civilization, with plant diseases having a substantial impact on both crop yield and quality. Early and accurate detection of plant diseases is essential for effective disease management and precision agriculture. In this study, a CNN-based approach for detecting deformities in plant leaves, using deep learning models including YOLO v8 for region of interest (ROI) extraction and VGG16, ResNet50, and InceptionV3, for image classification trained on the Plant Village dataset for the diseases scab, rot, and rust in apples along with healthy leaves has been proposed. The accuracy of the proposed approach was evaluated, and a graphical user interface (GUI) was developed for convenient disease detection. The ResNet50, VGG16, and InceptionV3 models achieved validation accuracy of 64%, 94%, and 96% respectively.

Link:
https://www.scopus.com/pages/publications/105034179939?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Field Emission Performance of 2D Ti2CTx (Tx = O2, F2, O–F) MXene: Experimental Insights and Theoretical Endorsement

AUTHOR :

Kakade P.M.; Aher R.; Kachere A.R.; Cho J.; Deore A.; Jadkar S.R.; Chauhan I.; Kim T.; Mandlik N.T.; Kim J.M.; Bulakhe R.N.

JOURNAL NAME:

ACS Applied Nano Materials (Vol.-9,Issue-15)

DETAILS:

Published on 7 April 2026

ABSTRACT:

Field emission (FE) is an important electron emission mechanism for vacuum microelectronic devices; however, conventional emitters often exhibit high turn-on fields, limited emission stability, and degradation during prolonged operation. Two-dimensional MXenes have recently emerged as promising FE materials due to their remarkable electrical conductivity, comparatively low work function, and tunnelable surface terminations. Nevertheless, most studies have focused on Ti3C2Tx MXene, while other compositions such as Ti2CTx remain largely unexplored, particularly regarding the influence of surface terminal groups on their electronic and emission properties. Herein, Ti2CTx (Tx = −F2, −O2, −OF) MXene was synthesized via selective chemical etching of the Ti2AlC MAX phase and investigated for its FE characteristics. The material exhibits a polycrystalline hexagonal layered structure with a high specific surface area of 349.02 m2 g–1. Ti2CTx MXene demonstrates excellent FE performance with a low turn-on field of 1.56 V μm–1 and a threshold field of 2.0 V μm–1 (at 10 μA cm–2), along with a stable emission for 4 h. Density functional theory calculations further reveal that surface terminations strongly influence the electronic structure and work function, with the experimental value of 4.66 eV closely matching the −F2 termination. These results highlight Ti2CTx MXene as a promising material for stable and efficient FE applications.

Link: https://doi.org/10.1021/acsanm.6c00228

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Blockchain in Insurance: Enhancing Claims Processing, Fraud Prevention, and Risk Management

AUTHOR :

Mishra A.; Kokare A.; Bhoite S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

The potential for enhanced transparency, security, and efficiency of blockchain technology-first made widely known by cryptocurrencies-has caused it to become a disruptive force in a number of businesses. Blockchain has the ability to completely transform operations in the insurance industry, which is a complicated environment with plenty of middlemen and bureaucratic procedures. The uses of of blockchain technology within the insurance sector are examined in this article, with an emphasis on how these applications may affect risk management, fraud prevention, and claim processing. This study adds to our understanding of how blockchain might change the insurance industry by analyzing present issues, possible advantages, real-world case studies, and anticipated developments.

Link:
https://www.scopus.com/pages/publications/105034093392?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Mathematical models to optimize pandemic spread and control strategies in public health management

AUTHOR :

Bhardwaj U.; Navale S.J.; Chanchlani A.S.; Murtuza S.D.; Dey D.; Khudaynazarov E.; Joshi N.

JOURNAL NAME:

Journal of Interdisciplinary Mathematics (Vol.-29, Issue-3)

DETAILS:

Published on 2025

ABSTRACT:

This paper presents mathematical models that may be applied to enhance the management of the health of the population and prevent pandemics. It is based on compartmental models such as SEIR and control variables such as the vaccine, quarantine, and social isolation to model disease spread and the effectiveness of interventions. Dynamic programming and optimal control theory are optimisation techniques that are applied to identify the optimal reaction plans. The outcomes of the simulation indicate that there are significant decreases in the rate of reduction of the number of infections and consumption of resources. The proposed models provide the lawmakers with practical information that can be applied to them in times of outbreak and pandemic scenarios to make timely and data-driven decisions.

Link:
https://www.scopus.com/pages/publications/105034046277?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Loan Defaulter Prediction using Machine Learning: A Comparative Analysis with Explainability Insights

AUTHOR :

Gahlot M.; Barve Y.; Panchal R.; Sakarkar G.; Dhawale V.

JOURNAL NAME:

Proceedings of 5th International Conference on Ubiquitous Computing and Intelligent Information Systems, ICUIS 2025

DETAILS:

Published on November 2025

ABSTRACT:

The precise prediction of loan defaults is very important for banks and other financial institutions to mitigate their risk. This study evaluates the performance of three different machine learning algorithms (SVM, RF, XGBoost) based on 255,347 real loan data from one of the largest peer-to-peer lending platforms. After conducting data preprocessing such as cleaning and feature encoding, the models were trained on an 80/20 split and tested using different metrics. XGBoost beat all competitors with a recorded performance of 91% accuracy, 87% recall, and 0.94 AUC-ROC, while Random Forest and SVM followed with 88% and 85% accuracy respectively. The recall score strongly indicates that the model (XGBoost) can effectively classify the group of defaulters, and the high AUC-ROC helps in classifying and ruling out the group of likely defaulters. The results were achieved without application of synthetic data for data balancing which is very common, nor exploitation of explainable methods thus strong baseline created for realistic applications. The results present banks with workable models for automating risk assessment or adjudication, and concurrently, showcase the significantly higher performance of XGBoost in credit scoring compared to other models. Besides, the research also points out and opens up new avenues for future research, such as developing interpretable models for regulatory approval as well as tackling class imbalance issues in financial datasets. The study demonstrates the potential of machine learning, particularly ensemble methods, to greatly enhance the effectiveness of credit risk management within the existing banking systems.

Link: https://doi.org/10.1109/ICUIS67429.2025.11380481

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Valorisation of Corn Cob Agricultural Waste for Continuous Chromium (VI) Removal: Fixed-Bed Column Performance and Breakthrough Analysis

AUTHOR :

Tirthakar S.; Dod R.

JOURNAL NAME:

International Journal of Environmental Research (Vol.-20, Issue-2)

DETAILS:

Published on 2 April 2026

ABSTRACT:

Hexavalent chromium [Cr(VI)], a toxic and carcinogenic pollutant commonly found in industrial effluents, poses serious environmental and health hazards. This study investigates the use of hydrochloric acid-activated corn cob powder as a low-cost biosorbent for Cr(VI) removal in a continuous fixed-bed column system. The influence of bed depth (25 and 30 cm), flow rate (1.0–3.8 mL/min), influent concentration (10–50 mg/L), and pH (2.5–5.66) was examined. Lower flow rates and higher bed depths enhanced Cr(VI) removal, while higher flow rates led to earlier breakthrough. Adsorption equilibrium data fit well with both Langmuir and Freundlich isotherms, with Langmuir providing a better correlation. Thomas and Clark models effectively described the column dynamics, confirming efficient performance for up to 2 h under optimal conditions. The study demonstrates that modified corn cob powder is a sustainable, low-cost, and effective biosorbent for Cr(VI) removal in continuous systems.

Link: https://link.springer.com/article/10.1007/s41742-026-01069-6

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Comprehensive Survey on mGDI Technology for Programmable Frequency Dividers

AUTHOR :

Doshi B.; Askhedkar A.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

This paper is a comprehensive review of Modified Gate Diffusion Input (mGDI) technology and its use in Programmable Frequency Divider Design. A modified version of the original Gate Diffusion Input (GDI) technique, mGDI technology has generated much interest as it can optimize area, increase speed, and reduce power consumption in digital circuits. This study methodically explains the development of mGDI technology its basic concepts that guide its functioning, and its particular use in programmable frequency dividers. Furthermore, the paper present a thorough examination of different design strategies, simulation outcomes, performance comparisons, and implementation challenges. Lastly an overview of current research initiatives, forthcoming developments, and possible future approaches for mGDI technology in programmable frequency dividers are covered in the conclusion.

Link:
https://www.scopus.com/pages/publications/105034064560?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A Review on the Artificial Intelligence-based Acne Detection Diseases

AUTHOR :

Dikholkar G.; Bobde S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

Acne disease which is considered to be the most common skin condition consumes time and money by taking doctor's appointments for most of the acne targeted people. To solve this problem Image analysis becomes an attractive part as it is an integration of both medical field and technology for human's betterment. It includes taking advantage of advanced technologies like Artificial Intelligence (AI), Convolutional Neural Networks (CNN), Deep Learning (DL) and Machine Learning (ML). By conducting literature surveys, the main aim is to explore acne type, the datasets, data processing techniques, data augmentation techniques, model image recognition, deep learning frameworks and evaluation indicators. Overall the paper focuses on a comprehensive summary of all Artificial Intelligence architecture and standard sequence which shows good and efficient results for the dermatological images.

Link:
https://www.scopus.com/pages/publications/105034094996?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Comparative Study Between Different Shapes of Pier and Velocities for Submersible Bridges

AUTHOR :

Kosalage G.; Patil J.

JOURNAL NAME:

Lecture Notes in Civil Engineering (Vol.-740 LNCE)

DETAILS:

Published on 2 January 2026

ABSTRACT:

Submersible bridge design demands careful consideration of many different aspects in order to guarantee structural soundness, hydraulic effectiveness, and visual harmony. This research offers a thorough examination of the substructure design for a submersible bridge, including the comparison of various pier shapes and water velocities. The goals are to define important design parameters, investigate alternate pier configurations, and assess how varied water velocities affect the substructure of the underwater bridge pier. Safety considerations, material standards, and load requirements are examples of design criteria. The study looks into how pier shapes—from cut and easy with 80’ to rectangular—affect aesthetic appeal, hydraulic efficiency, and structural integrity. In order to fully understand, the consequences of typical flow conditions and possible flood scenarios are also carefully examined.

Link: https://doi.org/10.1007/978-981-95-1726-8_26

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Supply Chain Model for Perishable Goods under Trade Credit Policy: A Literature Review

AUTHOR :

Gupta A.A.; Chauhan M.P.; Kumar A.; Rajak M.

JOURNAL NAME:

ES Food and Agroforestry (Vol.-23)

DETAILS:

Published on 4 March 2026

ABSTRACT:

In this competitive market, lot-sizing and pricing play a major strategic role for the retailers to gain maximum profit. This problem becomes very interesting while dealing with perishable items such as agricultural products dairy products, food, and meat. Such product degrades with time and loses its quality and value. Complexity for the decision-making increases when the demand for the items is dependent upon instantaneous stock and price. Naturally, a lot of factors are to be considered in order to get an optimum level of stock of goods for the smoother running of any enterprise. Determination of optimum level of inventory of deteriorating items becomes important due to decrease in their value with the passage of time, and it may even become zero after some time. Determining an optimal inventory for such goods depends upon many factors such as demand, deterioration rate, storage space availability, etc. The demand for such goods also depends upon various factors such as price elasticity, stock elasticity, credit period, time, quality, etc. This paper reviews supply chain models, especially for perishable items. It identifies various factors that affect demand which ultimately affects the decision of the supply chain. This paper also identifies role of technology in improving the life of perishable product and enhancing sustainability. This also identifies certain gaps that researchers can undertake in future.

Link: http://dx.doi.org/10.30919/faf2110

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Multimodal Speech Emotion Recognition: Deep Learning Approaches for Vocal Sentiment Analysis

AUTHOR :

Khande R.; Naik S.; Rajapurkar S.; Nisal R.; Sonsale I.; Deokar R.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3386, Issue-1)

DETAILS:

Published on 31 March 2025

ABSTRACT:

Vocal sentiment analysis (VSA) is increasingly important in fields like human-computer interaction, healthcare, and emotional AI, where recognizing emotions from speech is crucial. This report presents the development of a machine learning-based speech emotion recognition (SER) system, which classifies sentiments by analyzing features like Mel-frequency cepstral coefficients (MFCC), chroma, and Mel spectrograms. Using the RAVDESS dataset, the system was trained to detect emotions such as calm, happy, fearful, and disgust. Key steps included noise reduction, feature extraction, and training a Multi-Layer Perceptron (MLP) classifier. Despite challenges like noise and imbalanced data, the model achieved a classification accuracy of 74%, demonstrating its potential in applications such as customer service and healthcare. Future improvements could enhance emotion range, feature engineering, and deep learning techniques for real-world use.

Link: https://doi.org/10.1063/5.0327490

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Machine Learning and Deep Learning for Network Anomaly Detection

AUTHOR :

Aghav H.; Pande H.

JOURNAL NAME:

2025 International Conference on Future Technologies, ICFT 2025

DETAILS:

Published on November 2025

ABSTRACT:

Ensuring the security of network systems has become challenge nowadays, due to increase of cyber threats. Anomalies in network traffic indicated potential threats such as intrusion, policy violations, system failure. The research Machine Learning and Deep Learning for Network Anomaly Detection proposes a comparative study of multiple algorithms to develop an effective anomaly detection framework using Network System Laboratory (NSL), Knowledge Discovery in Database (KDD) dataset, our study implements and compares logistic regression, random forest, isolation forest and autoencoder models, along with hybrid approach combining isolation forest and logistic regression. We have done evaluation of models based on accuracy, precision, recall, Fl-score with performance of confusion matrix, feature importance and Shapley Additive Explanation visualizations. The result of hybrid model significantly outperforms individual methods in detecting anomalies with improved reliable performance. This research contributes for building adaptive and accurate intrusion detection system capable of safeguarding modern networks against evolving attack.

Link: https://doi.org/10.1109/ICFT66708.2025.11336792

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Mathematical foundations of neural networks for modeling human cognition in AI systems

AUTHOR :

Malwade S.; Lavate S.H.; Borkar P.; Jadhav P.D.

JOURNAL NAME:

Journal of Interdisciplinary Mathematics (Vol.-29, Issue-3)

DETAILS:

Published on 2026

ABSTRACT:

In this paper it examines the mathematical principles of the neural networks and how these can be applied to simulate the thoughts of people in computer systems that are expected to be intelligent. Certain significant aspects of the learning process are considered, such as linear algebra (with an emphasis on the operations of vectors and matrices) and calculus techniques such as the differentiation and gradients. The backpropagation technique is discussed in detail as one of the simplest approaches to training neural networks to minimize the error. There are also several optimization techniques including gradient descent and more advanced versions, which are considered to enhance the speed and precision of learning.

Link:
https://www.scopus.com/pages/publications/105033886215?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

AI-based Song Composition and Generation: A Comprehensive Research and Implementation

AUTHOR :

Kabadi P.; Khachane K.; Singh P.; Pande H.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2026

ABSTRACT:

Commencing with a professional tone, the genesis of our project stems from a fortuitous encounter with the transformative potential of artificial intelligence (AI) within the realm of music composition. During discussions on the confluence of technology and artistic expression, a captivating idea emerged among my colleagues and me: the integration of AI algorithms into music generation processes. We were particularly fascinated by the convergence of machine learning, natural language processing, and digital signal processing techniques in shaping the landscape of AI-driven music generation. Our project serves as a testament to the paradigm shift witnessed in music composition, propelled by advancements in AI technologies. Through meticulous examination, we seek to illuminate the implications, challenges, and opportunities inherent in AI-driven music composition, laying the groundwork for continued innovation and exploration in this transformative field.

Link:
https://www.scopus.com/pages/publications/105034187602?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Beyond the Norm: Exploring the Advantages of Homomorphic Encryption

AUTHOR :

Jagtap S.; Pujeri U.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2026

ABSTRACT:

The last wave of cyberattacks has shown how important data security and the development of advanced encryption methods are to society. Regrettably, the commonly employed conventional encryption techniques of today, such SHA, DES, and AES, are starting to become inadequate in safeguarding confidential information from unauthorized access. The current research focuses on the topic of whether homomorphic encryption protects data security better than traditional techniques. Homomorphic encryption has an advantage over its predecessors because of the special method it allows computation on encrypted data, which lowers the risk of data breaches during the decryption process. This research paper provides an in-depth review of the principles and comparative benefits, indicating that homomorphic encryption might be a helpful instrument for improving security and protecting privacy against modern dangers. Because of its special characteristics, homomorphic encryption is basically a kind of encryption that may be added to the toolkit of modern encryption techniques to solve the problem of data breaches and unauthorized access.

Link:

https://www.scopus.com/pages/publications/105034167810?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

A Comprehensive Review on Iron Oxide and Iron Oxide-based Nanomaterials for Wastewater Treatment

AUTHOR :

Mankad S.; Chaudhari S.; Ghodmare S.; Mahajan R.; Susladkar S.; Topare N.; Choudhari V.; Khedkar S.; Thorat P.

JOURNAL NAME:

Nature Environment and Pollution Technology (vol.-25, Issue-2)

DETAILS:

Published on April 2026

ABSTRACT:

The growing need for water and the increase in wastewater generation globally demand efficient water treatment processes. Conventional water remediation efforts are insufficient to meet current water treatment requirements. Nanomaterial water remediation has shown promising results and needs to be explored on a larger scale to address these issues. The most recent focus has been on composite nanomaterials made of iron oxide magnetic and superparamagnetic NPs, which have attracted considerable interest owing to their desirable characteristics, including excellent after-use recovery, targeted quality, and affordability. Iron oxide-based nanomaterials can remove organic and inorganic contaminants in multiple ways. In addition, several nanocomposites have been employed to improve their performance and incorporate novel advantageous characteristics. Chemical, green, and biological processes are used to produce these materials. Synergistic properties for water cleanup have been demonstrated using various iron-based nanocomposites. Various mechanisms of pollution removal, such as adsorption, desorption, photocatalysis, and flocculation/coagulation, have been targeted during the design of NPs. The types of water pollutants, choice of remediation methods, and various methods required for QC and the efficiency of these nanomaterials were reviewed. This review discusses various methods for preparing magnetic nanoparticles, their composite materials, the mechanism of pollutant removal, and recent applications exploring synergistic behavior for pollution removal for efficient water remediation. Issues such as safety, toxicity, removal after use, and disposal of these materials are also discussed. This manuscript provides a quick overview of iron oxide nanomaterials as a reference for advancing further studies in this area. We plan to contribute to the production bibliography of various aspects of iron-based nanomaterials for water and wastewater treatment.

Link:
https://www.scopus.com/pages/publications/105036651117?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

AI-Driven Skin Cancer Detection: A Comprehensive Review of Deep Learning Techniques for Early Intervention

AUTHOR :

Waghchaurer A.; Javale D.P.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2026

ABSTRACT:

This research paper comprehensively explores AI-driven skin cancer detection for early intervention, employing deep learning techniques. The study incorporates diverse literature surveys, utilizing various technique analyses to assess the effectiveness of the proposed approach. Using convolutional neural networks (CNNs), the model demonstrates promising capabilities in accurately identifying and classifying various skin cancer types. The literature surveys encompass many sources, offering a thorough understanding of existing methodologies and advancements in the field. The paper aims to contribute valuable insights into the intersection of dermatological research and machine learning, emphasizing the significance of early detection in improving patient outcomes. Incorporating different technique analyses enhances the robustness of the research findings, providing a nuanced perspective on applying deep learning in skin cancer diagnosis.

Link:
https://www.scopus.com/pages/publications/105034143974?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Leveraging Machine Learning for Early Detection and Prevention of Liver Disease Mortality in India

AUTHOR :

Rajpoot H.; Raj A.; Bhoite S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2026

ABSTRACT:

The most common causes of liver illness that results in death in India are alcohol-related liver disease and viral hepatitis, notably hepatitis B and C. Cirrhosis, liver failure, and hepatocellular cancer can develop as a result of these illnesses and can be fatal. Fatigue, stomachache, edema, and jaundice are typical symptoms. Confusion and bleeding are additional late-stage signs. The prevention of liver disease-related mortality in India can be greatly helped by early detection, hepatitis immunization, and lifestyle changes. There are several factors that contribute to liver disease in India, some of the most important ones being cirrhosis of the liver, chronic hepatitis B and C infections, excessive alcohol intake, and nonalcoholic fatty liver disease (NAFLD). These illnesses can cause serious symptoms like jaundice, exhaustion, abdominal discomfort, and, in more severe cases, liver failure. If left untreated, liver failure can be deadly and frequently results in death. Remarkably, India now reports 268,580 liver-related deaths each year, which constitutes 3.17% of all deaths and represents 18.3% of the 2 million liver-related deaths globally. We used different Machine Learning classification techniques, first we did data cleaning and visualized the data, split the data, standardized the data and applied PCA, performed logistic regression with PCA, logistic regression without PCA, Support Vector Machine, Gradient Boosting Classifier, Decision Tree Classifier, Random Forest Classifier without PCA, Random Forest Classifier with PCA, Random Forest Classifier with Feature Selection, Random Forest Classifier with PCA and Feature Selection.

Link:
https://www.scopus.com/pages/publications/105034170856?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Network pharmacology and in silico docking-based prediction of molecular targets of Pterospermum acerifolium in primary breast cancer and metastases to bones

AUTHOR :

Kharade S.; Datt M.; Godbole M.S.; Naik A.

JOURNAL NAME:

Computational Biology and Chemistry (Vol.-123)

DETAILS:

Published on April 2026

ABSTRACT:

Breast cancer is known to metastasize to distinct organs, including bones. Dysregulation of cellular receptors—particularly estrogen and growth factor receptors—drives tumor progression, therapy resistance, and metastasis. Natural bioactive compounds have potential to modulate multiple molecular targets, with minimal side effects. Here, we applied a network pharmacology and molecular docking approach to investigate the therapeutic potential of Pterospermum acerifolium in primary breast cancer and bone metastasis. While Pterospermum acerifolium possesses pharmacological properties—antioxidant and anti-inflammatory effects—its potential impacts on breast cancer metastasis remain largely uninvestigated. Based on literature and pharmacokinetic profiles of Pterospermum acerifolium, we selected three compounds viz. kaempferol, luteolin and β-sitosterol. We identified predicted genomic targets of these compounds from databases, and compared their lists of genes with those associated with breast cancer and its metastasis to bones. Functional enrichment analyses of the overlapping genes suggested association of cellular pathways central to tumor progression and bone metastasis, including PI3K-Akt, MAPK, VEGF and estrogen signaling. Network construction further identified key receptor-based targets—ERα, ERβ, IGF1R and VEGFR2—as hub-genes based on degree of centrality and connectivity within the protein–protein interaction network. Further, we performed molecular docking analyses to evaluate compound–receptor binding affinities; analyses revealed strong binding affinities, particularly with β-sitosterol, suggesting the multi-target therapeutic action. Interestingly, the molecular docking analyses indicated β-sitosterol to have stronger affinity to ERα, ERβ, IGF1R and VEGFR2 than that of their known inhibitors (tamoxifen, diarylpropionitrile, linsitinib and sorafenib, respectively).

Link: https://doi.org/10.1016/j.compbiolchem.2026.109051

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Next - Gen Smart Cloth Monitoring with Digital Twin Technology: Sensor Integration and Cloud Computing

AUTHOR :

Rangari D.; Gohokar V.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

In this era of technological advancements, wearable technology stands out as a rapidly evolving technology. One of these wearable technologies is Smart clothing. This combination consists of electronic components either sewed into the fabric or attached to the fabric which enhances the functionality and comfort of everyday clothing. This paper proposes the execution of digital twin systems for smart clothing by integrating the sensors with ESP32 controllers and using Blynk cloud platform. The cloud platform provides secure storage, analysing and visualising the collected data. With the help of Unity platform, a digital twin is created for smart clothing which mirrors the real-world data in virtual reality. By using the digital twin, it is possible to investigate the effectiveness of smart cloth, in its application in healthcare, sports performance analysis and more. This research verifies the dependability and validity of monitoring systems and lays groundwork for advancements in wearable technology and personalised healthcare.

Link:
https://www.scopus.com/pages/publications/105034125803?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

In silico aptamer design: from sequence selection to structural optimization and computational modelling strategies

AUTHOR :

Sinharay A.; Raut M.; Kale A.

JOURNAL NAME:

Journal of Computer-Aided Molecular Design (Vol-40, Issue-1)

DETAILS:

Published on April 2026

ABSTRACT:

Aptamers are of growing importance due to their high specificity, tunable affinity, and versatility across therapeutic, diagnostic, and biosensing applications. Unlike antibodies, they can be synthesized rapidly, modified easily, and remain stable under diverse conditions, making them powerful tools in both fundamental research and translational healthcare. The De Novo approach to aptamer development represents a paradigm shift from traditional SELEX-based methods toward fully computational, data-driven design. This strategy integrates bioinformatics, artificial intelligence, and molecular modeling to generate high-affinity aptamer sequences without relying on pre-existing libraries. Beginning with target characterization, ranging from small molecules to macromolecules and whole cells, the pipeline employs tools like SwissModel and AlphaFold for structural prediction, and FTsite or Fpocket for binding site identification. AI techniques such as Monte Carlo Tree Search, Hidden Markov Models, and Variational Autoencoders guide sequence generation, followed by secondary structure prediction and molecular dynamics simulations for interaction validation. Advanced platforms including AptaTRACE, RaptGen, AptaDiff, AptaTrans, and AiDTA demonstrate the power of generative modeling, transformer architectures, and reinforcement learning in aptamer discovery. These frameworks enable first engineering, validated through SPR and in vitro assays, and offer scalable solutions to overcome limitations in dataset size, structural modeling, and experimental throughput. The De Novo approach thus establishes a robust design-test-learn cycle, positioning AI-driven aptamer development as a cornerstone of next-generation diagnostics, therapeutics, and biosensing.

Link: https://doi.org/10.1007/s10822-026-00800-x

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Sign Language Recognition Using LSTM

AUTHOR :

Khande R.; Naik S.; Miranda S.; Trivedi U.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3386, Issue-1)

DETAILS:

Published on 31 March 2026 2026

ABSTRACT:

The project introduces an innovative method that employs deep learning techniques for real-time detection of American Sign Language. The main aim to develop model that can accurately classify American Sign Language gestures for enhancing talking for individuals having hearing and speech problems. The dataset underwent extensive pre-processing before being separated into training and testing. A sequential model consisting of multiple LSTM layers was employed for training, enabling the model to precisely capture the patterns present in sign language gestures. Following intensive training, the model achieved a 98% category accuracy and demonstrated good generalization on unseen data. Hypothesis testing confirmed that the model outperforms random guessing. The suggested approach is a very successful technique to close gaps in communication in the area of computer-human interaction. Applications for this approach are numerous and include educational resources, accessibility features in public services, and sign language translation systems. The project's enhancements will increase the deaf and hard to speak groups' accessibility and inclusivity.

Link: https://doi.org/10.1063/5.0327495

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Real-World Scalability of PostgreSQL: Practical Techniques Use Case Study

AUTHOR :

Ladkat J.K.; Waghodekar P.

JOURNAL NAME:

2025 IEEE International Conference on Blockchain and Distributed Systems Security, ICBDS 2025

DETAILS:

Published on November 2025

ABSTRACT:

Modern applications face significant performance degradation and escalating operational costs when handling large data volumes and high concurrency. Inefficient database scaling often leads to resource over-provisioning and financial waste. This paper analyzes five PostgreSQL scaling techniques: Vertical Scaling, Read Replicas, Partitioning, Connection Pooling, and Custom Sharding. Our findings demonstrate that Connection Pooling can reduce latency by 30% and increase throughput by 44%. This research provides a data-driven framework for architects to build cost-effective, high-performance PostgreSQL systems tailored to specific workload demands.

Link: https://doi.org/10.1109/ICBDS67396.2025.11377486

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Numerical study of performance characteristics of dual-fuel hybrid rocket engine using chemical equilibrium analysis

AUTHOR :

Siddharth P.; More S.; Jamjare P.; Oswal H.; Kshirsagar H.; Kumar N.; Jain S.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3369, Issue-1)

DETAILS:

Published on 18 March 2026

ABSTRACT:

The primary focus of this work is on hybrid rocket propulsion system with dual fuel technology. Dual fuels use two fuels and a single oxidizer as a propellant. When the execution of experimental evaluations proves to be impractical or cost-inefficient, particularly in the case of emerging and novel propellants like 3D printed ABS, the utilization of NASA's CEA software serves as a viable alternative, as it allows accurate estimation of rocket performance parameters like specific impulse (Isp) and characteristic velocity (C*). The present aim of the study is to compare the performance parameters of 2-dual fuel propellants using Chemical Equilibrium with Applications (CEA), taking into consideration different oxidizer-to-fuel ratios having hydrogen peroxide (H2O2) as an oxidizer with the first combination of Acrylonitrile Butadiene Styrene (ABS)+Paraffin and the second combination of Polylactic Acid (PLA)+ Paraffin. In the present study, an attempt is made to enhance the performance parameters of HRP systems. Given that dual fuels are a relatively new technology with a lot of potential for use as rocket fuel in the developing space industry, two combinations of dual fuels with H2O2 as the primary oxidizer are compared here. The two dual fuels are ABS with paraffin and PLA with paraffin. To compare their performance parameters, NASA CEA analysis (Chemical Equilibrium with Applications) is used at various O/F ratios and proportions. The different performance parameters like C∗ (characteristic velocity) and Isp (specific impulse) can be evaluated and the comparison of performance parameters for dual fuels with the help of CEA analysis and graphs are plotted. After the comparison of the performance parameters of two fuels with CEA analysis, came to the conclusion that PLA+Paraffin gives enhanced characteristics compared to ABS+Paraffin with increased Isp and C*. The future scope is to manufacture a 3D-printed matrix with modified geometry for experimental testing to find out its structural integrity, compatibility and real time values.

Link: https://doi.org/10.1063/5.0317435

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Detection of Fake News on Social Media Using Machine Learning Approach

AUTHOR :

Shah S.; Patel S.

JOURNAL NAME:

2025 World Conference on Cutting-Edge Science and Technology, WCCEST 2025

DETAILS:

Published on September 2025

ABSTRACT:

The digital revolution has transformed information dissemination, creating unprecedented access to news and content globally. However, this technological advancement has also facilitated the proliferation of misinformation across online platforms. Misleading content can significantly impact economic stability, political discourse, and social harmony, underscoring the urgent need for robust systems capable of distinguishing between factual and fabricated information. This research presents a comprehensive framework for misinformation detection utilizing cutting-edge data science approaches and machine learning algorithms. By employing natural language processing (NLP), advanced machine learning techniques, and statistical analysis methods, we identify distinctive patterns, textual characteristics, and contextual indicators that differentiate between authentic and fabricated news content. Our findings contribute to the development of automated verification systems that can enhance information integrity in digital spaces, fostering a more informed and discerning public discourse.

Link:
https://doi.org/10.1109/WCCEST66994.2025.11389931

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A Bridge Detection System Based on ESP32 Integrated IoT Technology with Multi-Sensor Data Acquisition for Real-Time Monitoring

AUTHOR :

Salim A.; Malik A.A.; Abullais F.; Ashraf H.; Gutte V.S.

JOURNAL NAME:

2025 IEEE 6th Global Conference for Advancement in Technology, GCAT 2025

DETAILS:

Published on October 2025

ABSTRACT:

The failure of bridge infrastructure poses a severe threat to the health and economic prosperity of the community at large. In this paper, we describe the design, construction, and successful demonstration of a low-cost, scalable IoT system for the real-time measurement of bridge health. Our prototype utilizes an ESP32 microcontroller to connect to a large array of sensors, such as a load cell for stress, a shock sensing vibration sensor, and a variety of environmental sensors. In this manner, the system can simultaneously detect structural stress, vibration anomalies, and environmental hazards such as flood. We demonstrated the efficacy of the system with a series of experiments run with our hardware prototype, which in turn successfully detected the simulated overload, flood, and vibration and properly tripped all local alarms. Our experiments demonstrate that this multi-sensor configuration is an efficient solution to real-time SHM and an important step toward the realization of more anticipatory regimes of maintenance for key infrastructure.

Link: https://doi.org/10.1109/GCAT66372.2025.11368595

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Transforming Insights: A Comparative Look at Data Analytics Techniques Shaping Business Intelligence

AUTHOR :

Rathod I.; Chavan A.; Bobde S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2026

ABSTRACT:

Data analysis is a crucial component in solving business problems these days in the era of big data. Given the immense volume of data present, companies utilize techniques like business intelligence to make well-informed decisions. Extracting actionable insights from large pools of datasets to enhance customer service and improve operational efficiency is vital, and business intelligence techniques are central to this endeavor. This paper aims at doing a comparative analysis of three main business intelligence techniques which are predictive modeling, data mining, and machine learning. This analysis helps in gaining insights at the strengths and weaknesses of all the techniques highlighting the role of data analytics in enhancing business decisions within information systems. This study looks at the main points like customer segmentation, demand forecasting challenges in terms of business decisions. By analyzing large datasets in real-time, organizations can boost their responsiveness and mitigate risks associated with fraudulent activities, while scenario modeling allows them to foresee and tackle potential issues before they escalate.

Link:

https://www.scopus.com/pages/publications/105034199813?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Automatic segmentation of knee tissues using MRI images: A review of literature

AUTHOR :

Kulkarni S.; Thengade A.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3369, Issue-1)

DETAILS:

Published on 18 March 2026

ABSTRACT:

Meniscus and cartilage tissues play important role in knee joint. Knee injury in these tissues affects the mobility of the patient and leads to poor quality of the person. MRI is preferred imaging for diagnosis of knee injury. Automatic segmentation of Knee cartilage and meniscus is crucial task in medical imaging applications and essential for diagnosis of disease, finalizing treatment procedure and monitoring healing process post-Treatment. Goal of this review is to provide valid descriptions of recent developments in knee segmentation techniques and approaches. The review compasses both knee cartilage and meniscus segmentation using deep learning-based methods and highlighting the advancements.

Link: https://doi.org/10.1063/5.0317809

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Cost Savings Through Quantum AI- Driven Optimizations

AUTHOR :

Dhawas P.; Faye P.; Pimpalshende P.; Deosarkar K.S.; Rewatkar R.; Joshi D.

JOURNAL NAME:

Optimizing Business Operations With Quantum AI

DETAILS:

Published on 2026

ABSTRACT:

This chapter explores the transformative potential of Quantum Artificial Intelligence (QAI) in driving significant cost savings across various business operations. As organizations face increasing pressure to optimize resources and enhance operational efficiency, traditional computational methods often fall short in addressing complex, large- scale problems. Quantum AI, which synergizes the computational power of quantum computing with advanced machine learning techniques, presents a promising solution. This chapter delves into the theoretical underpinnings of QAI, showcases real- world applications in logistics, supply chain, finance, and manufacturing, and provides a comparative analysis of cost efficiencies achieved through QAI- driven optimizations. Case studies and empirical evidence highlight how QAI not only accelerates decision- making but also minimizes operational redundancies, ultimately leading to substantial financial benefits. The chapter concludes with future directions and challenges in the adoption of QAI technologies in mainstream business practices.

Link: https://www.igi-global.com/chapter/cost-savings-through-quantum-ai-driven-optimizations/405298

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

AutoDeauth IoT: Enhancing Cybersecurity in IoT Device through Advance Penetration Testing and Vulnerability Assessment

AUTHOR :

Patel J.; Musale

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2026

ABSTRACT:

In Today's time there are differences types of Technologies used. In this technology we can use smart devices which is make our life so easy usefulness. Day to day there are different types of smart devices people are use. The smart device we can called as IoT device. IoT stand for Internet of Things. In IoT device we can use sensors which is sense the data and transfer the information or data to another device. With the use of IoT device there are different types of work we can easily solve. IoT device we can easy to buy it and store it in our life also it is small component of device which is work smart in our day-to-day life. There are several attacks occurred in IoT devices, in particular, there have been 35.82 billion IoT devices since 2021; by 2025, that number will rise to 75.44 billion. As a result, there will likely be an increase in security attacks against IoT devices, with the potential for significant harm to the underlying IoT system. IoT devices, firmware, hardware, software, applications, web servers, networks, and communication protocols come in a wide variety. IoT plays a crucial role in cybersecurity, both as an asset. In IoT device we use sensors which is use for Taking Information and transfer to another device. Sensor senses the information and pass to the server and after it will give the response to which task will it perform. But there are several problems are in IoT device one of common problem is security. Security is most import in device and it will save our data. We can apply different techniques like authentication, Identity Access Management (IAM), Data Encryption-Decryption, Patch Management, Forensic and Incident Response and Compliance and Regulatory Requirements these are some important in Cybersecurity use in IoT. That's why this paper is to explain about IoT device system (Ex: -IP Base Camera) via ethical hacking methods and tools, and find Vulnerability using penetration testing. Testing we can find the vulnerabilities in IoT devices and based on this vulnerability, we can reduce cyber-attacks and maintain the data security.

Link:
https://www.scopus.com/pages/publications/105034135202?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Removal of crystal violet dye from wastewater using Chitosan green peas peel powder composite as a biosorbent

AUTHOR :

Jadhav A.; Parikh S.; Kulkarni A.D.; Nandi S.; Khurpade P.D.

JOURNAL NAME:

Next Sustainability (Vol.-7)

DETAILS:

Published on March 2026

ABSTRACT:

Dye containing wastewater generated from industrial sectors such as textile, printing, leather, food, and cosmetics necessitates efficient treatment to prevent environment and human health risks. In present study, Green peas peel powder (GPP), Chitosan hydrogel particles (CHP) and composite of Chitosan-Green peas peel powder (CHGP) were utilized as an effective biosorbent for the removal of crystal violet (CV) dye from aqueous medium. The influence of various factors viz. adsorbent dosage, initial dye concentration and contact time on dye removal efficiency was examined. The CV dye removal efficiency was investigated using UV-Visible spectroscopy, while Fourier Transform Infrared spectroscopy (FTIR), Scanning Electron Microscopy (SEM), X-ray diffraction (XRD) and Thermogravimetric analysis (TGA) were employed for structural, morphological, thermal stability analysis of synthesized biosorbent. The maximum removal efficacy using CHGP composite of greater than 96% in first 30 mins and with 99.4% after 120 mins of contact time was achieved at pH 6. The nonlinear kinetic and isotherm studies revealed that adsorption process is better characterized by both Langmuir and Freundlich and pseudo-first and pseudo-second order model and showed a maximum adsorption capacity of 9.996 mg/g. Additionally, CHGP biosorbent was able to remove the 98% of CV dye after three regeneration cycles. Compared to single component CHP and GPP, CHGP composite exhibited enhanced adsorption performance as a result of its enriched active functional groups. Thermodynamic analysis revealed that the adsorption process is endothermic, spontaneous and favorable. TGA analysis of CHGP and CHP showed reduced thermal stability of composite. Overall findings of present study indicate that bio-composite of Chitosan-Green peas peel powder can be used as low-cost, environmentally friendly and circular-economy aligned solution for efficient removal of crystal violet dye from contaminated wastewater.

Link: https://doi.org/10.1016/j.nxsust.2026.100277

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

MCDM-based framework for visual inspection assessment in structural health monitoring of ageing arch bridges

AUTHOR :

Nilapwar D.; Minde P.
.

JOURNAL NAME:

Innovative Infrastructure Solutions (Vol.-11, Issue-5)

DETAILS:

Published on April 2026

ABSTRACT:

Aging bridge networks pose significant risks to safety in transportation, economic sustainability, and cultural preservation, especially in situations where limited resources curtail the application of advanced civil engineering in monitoring systems. The purpose of this study is to come up with a systematic approach to integrating careful visual inspection and the MCDM method to evaluate the structural health and to rank rehabilitation options along with heritage arch bridges. The methodology will utilize a systematic rating system to document deterioration indicators, including cracking, spalling, and damage caused by environmental factors, as well as structural, functional, ecological, social, and economic aspects. Such qualitative observations are fed into an MCDM model to give reasonable, unbiased suggestions. The model was verified on a stone arch bridge in Pune, India, built in the mid-nineteenth century. Under constant weather conditions, site inspections provided patterns of damage, and scoring was done by evaluating these damages against the established predetermined parameters. The analysis yielded the overall bridge health index of 4.33, which means that the structure is located in the crisis category, suggesting that reconstruction is the best intervention option. As evidenced in the results, visual inspection supplemented with MCDM can be used reliably to determine vulnerabilities and can be used to give open and defensible advice on maintenance planning. The implementation of the approach is a cost-competitive, flexible means of operational management of any bridge infrastructure, especially in areas where high-cost structural health monitoring systems are inaccessible.

Link: https://doi.org/10.1007/s41062-026-02653-7

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Developing an AI Model for Skin Condition Diagnosis and Treatment Guidance

AUTHOR :

Chavan A.; Panchal D.; Bobde S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2026

ABSTRACT:

Skin problems are a global concern, affecting millions and impacting their well-being. Early diagnosis and proper medications are crucial for successful treatment. This research introduces a groundbreaking deep learning model for automated skin disease diagnosis and personalized medication recommendations. The model utilizes a vast dataset of various skin condition images. It combines powerful technologies: CNNs analyze images to extract key features, RNNs learn from patient history and symptoms over time, and NLP techniques process written medical records and patient input. The diagnostic process starts with inputting images and relevant medical history. The model analyzes the visuals with CNNs and patient data with RNNs. This combined information leads to an initial diagnosis. The model then refines its accuracy by considering additional factors like medical history, patient demographics, and treatment effectiveness. Once a diagnosis is confirmed, the model recommends medications tailored to the specific skin disease, patient characteristics, and current medical guidelines. It factors in drug interactions, allergies, and potential side effects. Our model's performance on a large dataset shows high accuracy in both diagnosis and medication recommendations. It may even outperform dermatologists in some situations, particularly with complex or rare conditions. This research holds promise for advancements in telemedicine and healthcare access by offering a powerful tool for early diagnosis and treatment recommendations. Furthermore, the model has the potential to lessen the workload on dermatologists and expedite diagnosis and treatment planning. Overall, this deep learning model presents a promising approach to improve the accuracy and efficiency of diagnosing skin diseases and recommending medications. This technology can significantly benefit the healthcare system, especially in areas with limited access to dermatological specialists.

.Link:
https://www.scopus.com/pages/publications/105034085529?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Data-driven and experimental synergy: Metaheuristic-optimized extreme gradient boosting modeling of self-compacting concrete compressive strength

AUTHOR :

Sai Vardhan D.; Sharma A.; Biswas R.; Bura A.

JOURNAL NAME:

ENGINEERING Structure and Civil Engineering (Vol.-20, Issue-3)

DETAILS:

Published on 8 April 2026

ABSTRACT:

This investigation develops a comprehensive framework that integrates machine learning modeling with experimental validation for predicting the compressive strength of self-compacting concrete (SCC). The predictive models were constructed using a consolidated data set from existing literature and validated through independent laboratory experiments on ternary blends incorporating fly ash and silica fume. Experimental results demonstrated that optimized combinations of 30% fly ash and 5%–7.5% silica fume produced superior fresh-state properties, including enhanced flowability and reduced segregation, while achieving substantial improvements in compressive, tensile, and flexural strengths across all curing ages. Advanced ensemble learning techniques were employed by coupling Extreme Gradient Boosting (XGBoost) with three metaheuristic optimization algorithms: Tuna Swarm Optimization (TSO), Coyote Optimization Algorithm, and Giant Trevally Optimization. The XGB-TSO model demonstrated superior predictive performance, achieving coefficient of determination R2 = 0.9690, root mean square error of 2.15 MPa, weighted mean absolute percentage error of 2.63%, and Nash-Sutcliffe efficiency of 0.9674. Model interpretability analysis using SHapley Additive explanations (SHAP) identified concrete age and cement content as the most influential parameters, providing transparent insights into strength development mechanisms. Taylor diagram analysis confirmed statistical robustness through high correlation coefficients and minimal centered root mean square error. A graphical user interface was developed to enable real-time strength prediction from standard mix parameters, facilitating practical implementation. Experimental validation using laboratory-produced SCC specimens demonstrated excellent agreement with model predictions, achieving validation R2 = 0.9698 and mean absolute error of 1.83 MPa.

.Link: https://doi.org/10.1007/s11709-026-1277-9

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Synergizing graph embeddings and metaheuristic optimization for fraudulent review detection

AUTHOR :

Vayadande K.; Mishra A.; Bodhe Y.; Kale N.; Katariya A.; Kharade A.; Supekar P.; Patil L.

JOURNAL NAME:

International Journal of Machine Learning and Cybernetics (Vol.-17, Issue-3)

DETAILS:

Published on 19 February 2026

ABSTRACT:

Consumer choices, market dynamics, and brand reputation are all greatly influenced by customer reviews. However, the increasing number of manipulated or fake reviews damages digital platforms' integrity and erodes trust. This study introduces a hybrid model for detecting fraudulent reviews that combines graph-based methods and metaheuristic optimization with supervised and unsupervised learning approaches. Graph Autoencoders are used to identify anomalies in unlabeled datasets by learning latent graph structures, whereas GraphSAGE is applied to labeled review data to produce contextual embeddings through neighborhood aggregation. By fine-tuning model parameters, the Whale Optimization Algorithm (WOA) improves generalization and reduces overfitting. The last classifier is LightGBM. BERT embeddings, sentiment scores (VADER), and PCA for dimensionality reduction are all used in feature extraction. The approach exhibits improved capacity and adaptability compared to conventional models such as Graph Convolutional Networks (GCNs), Graph Attention Networks (GAT), and Recurrent CNNs. Four datasets—40K, Yelp, openSnippet, and Google Maps—are adopted to test the model. Its results show 98% accuracy, 0.99 precision, 0.95 recall, and an F1-score of 0.98. The outcomes demonstrate how well structural, semantic, and optimization methods work together to determine fraudulent reviews in dynamic, large-scale settings.

Link: https://doi.org/10.1007/s13042-025-02838-z

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Custom CNN for Gujarati Letter Recognition: Enhancing OCR Accuracy with Deep Learning

AUTHOR :

Patel M.; Bhoite S.; Panchal R.; Metkewar P.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2026

ABSTRACT:

Detection as well as recognition of Gujarati letter (GL) forms is not only a crucial step in several projects, but also it can be considered to be an initial state of the languages processing pipeline. Optical Character Recognition (OCR) by Convolutional Neural Networks (CNN) has been seen to have promising outcomes which is the way by sending this method into automation. In this regard, we suggest a design of a custom CNN network comprising of the elements matching the local shape of the recognised GL. In the CNN model, a dataset of Gujarati characters is used as a domain for the hyperparameters to train, such as learning rate, batch size and dropout rate. The play through of the version under consideration is appraised using a classification an account, which will furnish information on the process, don't forget and F1-score for each magnificence. Last but not least, the metrics which encompass accuracy and loss is also computed to measure the general performance of the version being utilized. Through image processing automation that detects various types of Gujarati characters, this technology helps the process to save and evaluate the green data which is written in documents with Gujarati language as well. In addition, it enables the development of such factors as inclusive textbooks and tools for the community which is Gujarati-speaking. The proposed system of OCR device that exploits a specific CNN technique to resolve the demanding situations of Gujarati alphabet identification and classification shows how the deep learning algorithms could be useful in this process which can be invaluable both to language science and technological developments.

Link:
https://www.scopus.com/pages/publications/105034071466?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Biometric authentication systems: Trends, challenges, and future prospects – A comprehensive review

AUTHOR :

Kakade S.; Raut U.

JOURNAL NAME:

MethodsX (Vol.-16)

DETAILS:

Published on April 2026

ABSTRACT:

With cyber security concerns high on the list of issues, it is no surprise that demand for secure confidentiality for all users and objects is at an all-time high; at the same time, the development of robust reliable systems for providing confidentiality is also at an all-time high due to the increasing degree of use of the internet. Systems will utilize the authenticated user identifying that combines both provided user identifying information with data stored in a secure database. Traditional authentication methods (passwords and pin numbers) have been proven inadequate to provide robust security and improve user experience with the rise of cyber security threats. Individual unimodal biometric systems face multiple challenges. For this reason, a multi biometric authenticating system (using more than one biometric characteristic) would be a viable solution to the limitations of unimodal biometric authentication systems by providing greater robustness and reliability to the authentication process. Multimodal biometric authentication systems leverage several biometric traits, to boost the security and accuracy of identity verification. The proposed system has four major components such as preprocessing, feature extraction, feature fusion, and authentication. By merging data from multiple modalities, these systems get around the limitations of unimodal biometric systems.

Link: https://doi.org/10.1016/j.mex.2026.103908

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Multi-modal Deep Learning for Medicinal Plant Identification: A Comparative Benchmark Study

AUTHOR :

Jagdale S.; Pande H.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1843 LNNS)

DETAILS:

Published on April 2026

ABSTRACT:

This study presents a comparative analysis of deep learning models used for medicinal plant identification, highlighting the limitations of single-modal approaches and proposing a multi-modal framework integrating leaves, bark, stems, and flowers. We evaluate various existing methodologies and introduce a novel hybrid CNN-Transformer model for enhanced accuracy. Our proposed model achieves superior performance in real-world scenarios and paves the way for robust medicinal plant classification.

Link: https://doi.org/10.1007/978-3-032-19300-1_4

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Advanced Scene Recognition with Digital Image Processing and Machine Learning

AUTHOR :

Patil C.H.; Bhoite S.; Patil H.; Jabde M.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol-1)

DETAILS:

Published on 2026

ABSTRACT:

This paper presents a comprehensive scene recognition system implemented in Python using Digital Image Processing (DIP) techniques. Scene recognition is a fundamental problem in computer vision with numerous real-world applications, including autonomous navigation, surveillance, and augmented reality. Our system leverages DIP algorithms to extract and analyse key features from input images, enabling it to classify scenes into predefined categories accurately. The core of the system comprises a combination of feature extraction, feature representation, and machine learning components. We demonstrate the effectiveness of our approach through extensive experimentation on benchmark datasets, achieving state-of-the-art accuracy and showcasing the system's robustness in handling diverse environmental conditions and scenes. Additionally, the open-source implementation allows for customization and further research in the field of scene recognition and computer vision (CV).

Link:
https://www.scopus.com/pages/publications/105034142592?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Empowering Small Scale Farming through a Compound Gear Train Based Irrigation Model that Promotes Environmental Sustainability

AUTHOR :

Nayak R.C.; Kulkarni M.V.; Bhujabal D.; Khedikar A.R.; Venkatamuni T.

JOURNAL NAME:

Indian Journal of Environmental Protection (Vol.-46, Issue-2)

DETAILS:

Published on 2026

ABSTRACT:

Irrigation is a vital component of agricultural practices; it is usually made possible by externally operated devices, such as those powered by electricity and fossil fuels. However, these externally operated irrigation systems place a burden on small-scale farmers. While a manual irrigation system offers better profit margins, it is time- and labour-intensive. The issues associated with manual irrigation are addressed by a technology-based model, which is described in this work. The designed model features a compound gear train arrangement alongwith an energy storage device. This setup is intended to be attached to a hand pump to lift water using manual effort. Thanks to the gearing arrangement and energy storage, minimal human effort results in maximum water lift without external power sources. With this device, water can be lifted from wells, rivers and any water storage. The system promotes environmental sustainability and improves farmers' profit margins in agriculture. It can lift 25 L of water per minute with six complete rotations of the hand pump handle. This demonstrates its ease of operation and the viability of the design. Overall, the system offers a better solution for enhancing irrigation efficiency in resource-constrained agricultural practices.

Link:
https://www.scopus.com/pages/publications/105036508121?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Elucidating morphometric, trichome structure and phytochemical variations among six Mentha accessions from different geo-climatic regions of India
s

AUTHOR :

Chatterjee D.; Debnath B.; Goswami A.; Kutty N.N.; Mitra A.

JOURNAL NAME:

South African Journal of Botany (Vol.-192)

DETAILS:

Published on May 2026

ABSTRACT:

The genus Mentha (Lamiaceae), widely distributed across the globe, holds immense economic significance due to its distinct aroma and pharmaceutical applications. Extensive natural hybridization within the genus has led to complex taxonomic challenges for demarcating numerous species, subspecies, and varieties. Profound intra- and interspecific variations in the morpho-physiology and volatile profiles of these varieties are often shaped by geo-climatic factors such as altitude, temperature, and environmental stress. In this study, six Mentha accessions representing three different species (M. spicata, M. arvensis, and M. rotundifolia) collected from distinct geographical regions of India were comparatively characterized for morphological traits, glandular trichome distribution, and phytochemical profiles. Molecular marker-based differentiation using inter simple sequence repeat (ISSR) analysis was employed as a supportive tool to assess genetic relatedness among the accessions. The M. spicata (Ms) accessions exhibited significant intraspecific diversity among them, particularly in vegetative growth parameters, trichome architecture and phytochemical profiles, depicting high adaptive plasticity. Amongst them, MsKGP (Kharagpur) showed the highest trichome density (73.18 Nos./mm2) and carvone concentration (5206.70 nmol/g fresh mass), while MsKL (Keylong) contained the highest rosmarinic acid levels (1151.64 µg/g fresh mass). M. arvensis (Ma) consistently formed a distinct cluster in morphometric, biochemical and ISSR-based groupings, primarily due to its high menthol content (8533.07 nmol/g fresh mass) and robust morphological traits, including broad stems and thick leaves, associated with enhanced structural resilience. In contrast, despite exhibiting genetic distinction in the ISSR-based dendrogram, M. rotundifolia (Mr) clustered with M. spicata (Ms) accessions in morphometric and biochemical groupings, indicating a pronounced interspecific convergence of phenotypic traits.

Link: https://doi.org/10.1016/j.sajb.2026.03.037

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Bias corrections in reanalyzed daily maximum and minimum temperatures for the metropolitan environments in Western India

AUTHOR :

Iyer S.R.; Prajapati S.; Reji M.J.K.; Kedia S.; Patro B.S.; Vellore R.K.; Singh B.B.

JOURNAL NAME:

Climate Dynamics (Vol.-64, Issue-4)

DETAILS:

Published on 8 November 25 March 2026

ABSTRACT:

This study examines the bias corrections (BCs) to ERA5-reanalyzed daily maximum (Tmax) and minimum (Tmin) temperatures for the metropolitan environments of western India, located on the coastal plain (Mumbai), elevated plateau landmass (Pune), and inland plain (Ahmedabad), using quantile mapping (QM) and machine learning (ML) approaches. Four ML models are used in this study that are trained with 18 predictors against the observed set of Tmax and Tmin. ERA5-diagnoses based on the period 1980–2019 in these environments exhibit cold [warm] bias in Tmax [Tmin], with the largest bias seen in the coastal environment. Application of QM generally shows greater skill in BCs of ERA5 temperature distributions, and substantially reduces RMSEs and improves the reproduction of observed variability in the coastal and plateau environments on annual and seasonal scales. All ML models used in this study showed near-similar performances in BCs and outperformed the QM BCs. The ML approaches show the largest BC skill of 80% [60%] in Tmax [Tmin] in the coastal environment and also exhibit 20–30% higher BC skill achieved by QM across all environments. The ML-driven BCs also display 3–4 [2] fold RMSE reductions in Tmax [Tmin] in all environments relative to ERA5 fields, and enhanced retrieval of observed variability in Tmax in the coastal environment relative to QM. They also show greater skill in exhibiting the inter-annual variations and interdependence in Tmax and Tmin than QM. The skill diagnostics further show ML and QM-corrected Tmax events in the range 300–310 K [300–315 K] have undergone significant BCs in the coastal [elevated plateau] environment. While QM and ML substantially improve the representation of the upper tail of the raw-ERA5 diagnosed Tmax distribution, ML methods offer additional improvements ranging from 15% to 36% in skill across different environments. Furthermore, ML-based bias correction improves the accuracy of heat wave diagnoses by 27–40% compared to raw-ERA5 across different environments.

Link: https://doi.org/10.1007/s00382-026-08104-4

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Semantic Segmentation of Multispectral Satellite Images Using Residual Convolutional Networks

AUTHOR :

Chandra A.; Phadke A.C.; Deshmukh V.

JOURNAL NAME:

International Journal of Image, Graphics and Signal Processing (Vol.-18, Issue.-2)

DETAILS:

Published on 2026

ABSTRACT:

Satellite imagery is always used to study spatial geographies to find water, residential, farmland, and forest lands; which can be further used for township development and planning, landscape detection etc. Semantic segmentation and image classification are the two crucial procedures in determining the spatial geographies. In order to improve the generalization ability of semantic segmentation algorithms, a combined model of UNet_ResNet is used in this paper. The engineered model is a type of Convolutional Neural Networks using GeoGANs which detects semantic patches in neural networks with smaller sizes and regional characteristics within a certain spatial and pixel scale. However, it faces a semantic segmentation challenge of identifying roadways in metropolitan areas. The model shows an accuracy score from 93% to 97.3% for image classification and segmentation purposes which fares better than the implementation of various existing architectures.

Link:
https://www.scopus.com/pages/publications/105034979092?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Three years of chemotherapy tolerance with concurrent Ayurvedic treatment in a metastatic lung adenocarcinoma: A case report

AUTHOR :

Nimbalkar R.G.; Marne P.A.; Kulkarni V.M.; Baheti A.M.; Pawar A.T.; Tagalpallewar A.A.; Nimbalkar M.R.

JOURNAL NAME:

Journal of Ayurveda and Integrative Medicine (Vol.-17, Issue-2)

DETAILS:

Published on March 2026

ABSTRACT:

Lung adenocarcinoma, a prevalent form of non-small cell lung cancer, presents significant challenges due to its advanced stage at diagnosis and heterogeneity. This case report details the therapeutic journey of a 61-year-old female patient diagnosed with metastatic lung adenocarcinoma, managed through an integrative approach combining chemotherapy and Ayurvedic treatment. Conventional therapy consisted of carboplatin, pemetrexed, and geftinib, targeting both primary and metastatic sites. Concurrent Ayurvedic treatment was introduced to alleviate chemotherapy-related side effects and enhance the patient's quality of life. Over a 36 months period, the patient demonstrated minimal side effects and a near-complete regression of the primary lung lesions. This case highlights the potential of Ayurvedic medicine as an adjunct to chemotherapy, offering improvements in symptom management and overall patient well-being, without obstructing the chemotherapy efficacy.

Link: https://doi.org/10.1016/j.jaim.2026.101325

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Product Visibility in Advertising: A Deep Learning-based Analysis of Food and Cosmetic Advertisements

AUTHOR :

Joshi M.; Krishnan P.; Savkare U.; Dongre S.; Deshpande S.; Apte R.; Bedekar M.

JOURNAL NAME:

SSRG International Journal of Electrical and Electronics Engineering (Vol.-13, Issue-3)

DETAILS:

Published on 31 March 2026

ABSTRACT:

Advertising today relies a lot on visuals. When a product is shown clearly in the advertisement, it increases attention and helps people remember and purchase the brand. Product detection in advertisements is hence the crucial need of businesses in today's world. Most existing systems mainly look for logos, advertisement sections, or general categories. They do not explore how clearly and how often the product appears throughout the whole video. Manual review of an advertisement video takes a lot of time, and it depends on personal judgment. Older computer vision techniques fail to detect products in real-world conditions like blur, objects blocking the view, changing brightness, and fast scene changes. With the intent of addressing the earlier-mentioned issues, this paper offers a system called a Product Visibility Analysis for Advertisements (ProVis-Ad) to automatically detect the product and measure its visibility in the real advertisements. The proposed work utilizes Deep Learning models, namely, You Only Look Once version 8 (YOLOv8), version 5 (YOLOv5), Faster Region-based Convolutional Neural Network (R-CNN), and Single Shot Multibox Detector (SSD300) to detect the product in an advertisement. The research includes eight datasets made from 155 real food and cosmetics advertisements, containing 10,810 labelled frames made using Roboflow and the Computer Vision Annotating Tool (CVAT). The ProVis-Ad system calculates product visibility for each video frame to identify the total duration of the presence of the product on screen in the advertisement. The results show a clear difference in the performance across models and advertisement domains. Food advertisements show more consistent product visibility than cosmetics advertisements. The system also introduces a new brand-level price measure to check if the products with a higher price get more on-screen attention. Experimental results demonstrate that the performance of YOLOv8 is superior to that of other models with respect to accuracy and F1-score for the detection of products in advertisements.

Link: https://doi.org/10.14445/23488379/IJEEE-V13I3P116

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Experimental Beneficiation Approach To Improve Performance Of Brick Recycled Aggregate In Cement Mortar

AUTHOR :

Khairnar N.; Mashalkar S.; Sakhare V.

JOURNAL NAME:

Journal of Chemical Technology and Metallurgy (Vol.-61, Issue-2)

DETAILS:

Published on March 2026

ABSTRACT:

The increasing volume of construction and demolition waste (CDW) poses significant environmental challenges, necessitating effective recycling strategies to promote sustainable development in the construction sector in India. This paper examines the current state of CDW management, particularly focusing on brick waste, which is a major contributor to the overall waste generated in country. The study explores experimental techniques to enhance the properties of recycled aggregates, including water absorption and efflorescence tests, conducted according to established IS codes. From CDW, brick waste was derived as fine aggregates. Prior literature results indicated that brick aggregates (BA) exhibit higher water absorption due to their porous structure, highlighting the need for effective treatment methods. Different surface treatment slurries, such as cement, fly ash, and ground granulated blast-furnace slag (GGBS), were applied considering the Beneficiation approach to brick aggregates to improve their performance. Utilizing treated 3 types of aggregates, mortar cubes were casted, and results are then compared to cubes casted using conventional sand and brick aggregate without any coating. The compressive strength result of GGBS coated brick aggregates at 28 days compared with sand and BA shows 5.57% and 29.17% more respectively. Fly ash and cement-coated aggregated performed comparatively lesser results than GGBS coating. Similar results are observed for water absorption and GGBS aggregates as the findings underscore the potential of utilizing recycled materials in construction, contributing to resource conservation and environmental protection. This research advocates for a paradigm shift towards sustainable practices in the construction industry, emphasizing the importance of recycling and reusing materials to mitigate the adverse effects of CDW on the environment.

Link: https://doi.org/10.59957/jctm.v61.i2.2026.12

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A computer vision approach for analysis of automatic vehicle accommodation

AUTHOR :

Kulkarni S.; Tiwari G.; Jagtap S.; Desai M.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3369, Issue-1)

DETAILS:

Published on 18 March 2026

ABSTRACT:

A significant amount of traffic congestion problems is a consequence of users searching for parking spots in large and crowded areas. Statistically the majority of the population avails private transportation for commutation, it leads to parking problems where there is a lack of appropriate parking management systems. This paper explains a new developed method for smart parking management systems. With the help of the YOLOv5 model and libraries like PyTorch and OpenCV we aim to solve this obstacle by creating a software that identifies the vacancies in a parking lot without dedicated parking spots and allow users to park accordingly. By harnessing the capabilities of a security camera as a parking monitor, the idea is to ease the hassle of finding a spot to park in by relaying the occupancy information on a web application.

Link: https://doi.org/10.1063/5.0318195

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

ChSp-ACN: Channelized Spatial Attention Enabled Adam-Optimized Convolutional Neural Network for Intrusion Detection

AUTHOR :

Patil N.; Joshi S.

JOURNAL NAME:

Cybernetics and Information Technologies (Vol.-26, Issue-1)

DETAILS:

Published on 1 March 2026

ABSTRACT:

Intrusion detection is a major concern in network systems where numerous smart devices are interconnected to handle sensitive information. Such interactions expose networks to threats like weak authentication, eavesdropping, malicious payloads, and a high false alarm rate. To address these challenges, a Channelized Spatial Attention enabled Adam optimized Convolutional Network (ChSp-ACN) is developed to identify malicious activities. The proposed ChSp-ACN effectively manages data imbalance and refines input features using KNN imputation and normalization. Its spatial attention mechanism enhances detection accuracy by focusing on relevant attack features, while the Adam optimizer fine-tunes model parameters to minimize false positives. Experimental evaluation demonstrates that ChSp-ACN achieves superior results compared to existing methods, attaining an accuracy of 97.22%, specificity of 97.24%, sensitivity of 97.20%, and a False positive rate of 0.03, which attains maximal performance effectiveness under the BoT-IoT dataset.

Link: https://doi.org/10.2478/cait-2026-0007

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Small Molecule based Drug Discovery using Machine Learning

AUTHOR :

Patel V.; Sonawani S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

We outline a process for building particular kinds of neural networks made up of structures that are intimately related to the structure of the molecule being studied. A cellular neural network can be programmed to solve a special neural connection problem that represents a molecule. which a cellular neural network can be trained using. The concept involved converting chemical structures, such as peptides or tiny organic compounds, into a RNN-based self-learning environment. In order to find and create novel drugs to treat illnesses and enhance human health, the discipline of drug discovery is crucial. It entails a difficult, multidisciplinary process that combines several scientific and technological viewpoints. Machine learning techniques have become effective instruments in the drug discovery process, providing chances to speed up and enhance efficiency. For activities like virtual screening, predictive modeling of compound attributes, optimization of drug candidates, and discovery of new therapeutic targets, machine learning techniques can be used. By easing data processing, offering insights into intricate biological systems, and directing experimental decision-making, these methods have the potential to shorten the time and expense associated with the drug development process. They can aid in the selection of candidates that have a greater chance of success, minimizing the number of substances that must be synthesized and tested experimentally by doing this process we can get results much faster then traditional drug discovery methods.

Link:
https://www.scopus.com/pages/publications/105034168450?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Rice Plant Leaf Disease Detection using Machine Learning

AUTHOR :

Singh S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2026

ABSTRACT:

Recent advancement in A.I. have significantly extended the smart farming and the early invention of plant syndrome came with a new way of efficient and accurate practices resultant in diagnosis of leaf and fruit problems. There are so many efforts taken in the type of plant disorder. This research examination basically used on image analysis which is frequently done by the hand of scholars. There are several image related databases of information regarding plant syndrome. Both the data researcher (scientists) and agriculture specialists are interested about secondary use of the photos for M2 -based analysis and farming. Advances in M.L. such as deep learning has produced very accurate outcomes in the field of plant syndrome. Current article discusses the fascinating contributions made by the numerous researchers working on this topic and draws attention to the difficulties that are thought to be crucial to this time of enquiry. Additionally, a few popular ML techniques employing KNN, Random Forest and Logistic regression, produced classification of accuracy with 96.2%, 98.6% respectively.

Link:
https://www.scopus.com/pages/publications/105034208831?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Advanced skin delivery of L-arginine: design, characterization, and anti-aging efficacy of optimized cubosomal nanocarriers

AUTHOR :

Vinchurkar R.; Kuchekar A.

JOURNAL NAME:

Pharmaceutical Development and Technology

DETAILS:

Published on 28 March 2026

ABSTRACT:

The purpose of this study was to develop a L-arginine-loaded cubosomal nanocarrier cream for topical anti-aging application. Glyceryl Monooleate and Poloxamer 407 cubosomes effectively encapsulated L-arginine, resulting in a nanosized structure (~34.7 nm) with high entrapment efficiency (71.67 ± 0.81%). Optimal drug content (96 ± 0.08%), ideal viscosity (19,666 cps), and skin-compatible pH (6.4 ± 0.3) were obtained when incorporated into a cream base containing almond oil, Cosmacol ELI, and Sepineo P600. Formulation physiochemical compatibility was confirmed by FTIR and DSC study, sustained drug release (78.92% over 6 h) shown by in vitro release study. Reduced TNF-α expression indicated that the formulation did not elicit any pro-inflammatory response, whereas cell viability was found to be above 80%. Reduced MMP-1 and increased collagen I gene levels demonstrated anti-aging efficacy. Over a six-month period, stability studies confirmed that there was no phase separation. Overall, the cubosomal cream showed outstanding entrapment, stability, safety, and anti-aging potential, offering a promising non-invasive cosmeceutical approach for skin rejuvenation.

Link: https://doi.org/10.1080/10837450.2026.2652978

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Integrated computational and structural understanding of Prunus bokharensis-derived β-Glucan: HRMS, network pharmacology, docking, and MD simulations to discover multi-target interactions for immunomodulation, antimelanoma lipid–hormone axis modulation, and erythroprotection

AUTHOR :

Chaudhari S.; Gaikwad S.; Polshettiwar S.

JOURNAL NAME:

Computers in Biology and Medicine (Vol.-209)

DETAILS:

Published on 28 April 2026

ABSTRACT:

β-Glucan, which is a type of polysaccharide, provides both cytoprotective effects and immunomodulatory effects, which scientists can use to develop treatments for hematologic conditions and melanoma through their ability to regulate lipid-hormone pathways. This study develops a computational framework to validate its effectiveness by combining network pharmacology and docking and Molecular Dynamics (MD) and In-vitro studies and experimental proof to study the immunomodulatory effects and antimelanoma Lipid–Hormone Axis modulation effects and Erythroprotection capabilities of β-Glucan obtained from Plum (Prunus bokharensis) PLYE1 through its extraction and characterization. β-Glucan extracted (NaOH/NaClO, 3.2 gms ± % yield) and characterized (HRMS: DP 1–5, β-(1 → 3)/(1 → 6) linkages). Network analysis using TCMSP and DisGeNET together with network analysis methods identified 110 compounds and 204 melanoma genes as research targets while they classified β-Glucan with a perfect score of 100 and identified NPC1L1 and HMGCR and NR1H3 and ESR2 and SHBG as essential network elements. Docking displayed high-resolution parameters between 2.00 and 3.3 Å together with high stereochemical accuracy enabled target protein assessment. Ramachandran plot analysis addressed ligand bound structures maintained their biological integrity which enabled accurate evaluation of β-Glucan therapeutic potential. The 500 ns MD simulation of the 7N4X–β-Glucan complex demonstrated binding stability through RMSD measurements which disclosed that the system reached equilibrium between 200 and 250 ns and maintained a stable distance range of 4.5 to 5.5 Å. The RMSF results showed that most residues displayed minor fluctuations beneath 1.5 Å while loop areas experienced greater movement that reached 3 to 6 Å. The radius of gyration remained stable at 4.3 to 5.0 Å which demonstrated that the protein maintained its compact structure while continuing to interact with ligands. The in-vitro study demonstrates that β-Glucan functions as an external ligand which triggers receptor-based immune response activation together with an increase in phagocytosis of 72.14% and an induction of cell death at an IC50 value of 104.33 μg/mL

Link: https://doi.org/10.1016/j.compbiomed.2026.111710

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Effect of vibration on Li-ion battery based on mathematical modelling with MATLAB simulink

AUTHOR :

Kanap G.M.; Pagar N.D.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3344, Issue-1)

DETAILS:

Published on 9 April 2026

ABSTRACT:

Nowadays, Li-ion batteries are gradually castoff as the primary energy-storing source in transportable applications such as on-road electric cars and off-road electric machines, in which steady and unadorned vibrations occur. As the market for Li-ion battery cells raises, so does the need to understand how mechanical shocks and vibrations impact the mechanical properties and electrical performance of Li-ion batteries. Only a few recent studies have looked at how vibrations and dynamic loads affect how battery cell materials deteriorate and wear out as well as how vibrations affect the structure of battery packs. This evaluation concentrated on new developments in assessing the impact of vibrations and dynamic loads on li-ion battery cells to develop the consideration of li-ion cells and battery packs. Therefore, the focus of this work was to examine how vibration affects the 1C capacity, resistance, and consistency of li-ion cells. The technique variations of the capacity and the resistance of the cells, both pre-Test and post-Test, were examined using a greater number of sample sizes based on mathematical modelling with MATLAB Simulink. At the 90-95% confidence level, the data showed that vibration caused a large increase in DC resistance and that there was frequently a decrease in 1C capacity as well. Additionally, a clustering technique was used to examine the impact of vibrations on the battery cell reliability based on a multi-feature quantity; the results reveal the consistency of the battery cell had declined post the vibration test.

Link: https://doi.org/10.1063/5.0318142

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Design and Development of Colorimetry based Optical Soil pH Meter

AUTHOR :

Shukre V.A.; Patil S.S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

Soil pH is a vital characteristic as it directly affects the accessibility of vital nutrients in the soil. Measuring and managing soil pH is fundamental for creating an environment that supports overall plant health. In this research work, different methods of measuring soil pH are discussed along with their pros and cons. This paper aims to develop a cost-effective and portable pH meter prototype based on the colorimetry principle using soil test kit reagents. TCS3472 color sensor is used for sensing RGB Color component of the solution under test which is interfaced with Node MCU (ESP8266). Trials are conducted to obtain the true color response of the reactants, which will be utilized as color benchmarks. The mathematical model is developed based on the analyzed data. The system is calibrated and validated using Prerana Laboratories Soil Test kit. The device is tested using 10 soil samples collected from different states of India with different pH levels. By using the standard deviation method system performance is analyzed. The system accuracy is found to be 99.30%. The values obtained from the sensors are displayed in a user-friendly embedded web server application without Internet as well as on system LCD. Based on the pH level system also classifies soil samples as acidic, neutral, and alkaline. To facilitate the measurement of Soil pH for farmers from rural areas where Soil testing labs are not easily available, this non-contact type portable pH meter will play an important role to periodically test soil pH to improve soil fertility where accuracy, speed, non-destructive testing and reduced maintenance are critical factors.

Link:
https://www.scopus.com/pages/publications/105034181400?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Methotrexate Nanosuspension for Targeted Lung Cancer Therapy: Development, Optimization and Evaluation of Dry Powder Inhaler

AUTHOR :

Hable A.; Dargude S.; Chabukswar A.; Jagdale S.

JOURNAL NAME:

Biomedical Materials and Devices

DETAILS:

Published on 31 March 2026

ABSTRACT:

Oral or parenteral administration of methotrexate (MTX), a folate antagonist with strong anti-inflammatory and anticancer effects, is problematic due to systemic toxicity and poor site-specific delivery. The present study aimed to develop and optimise a MTX nanosuspension–based dry powder inhaler (DPI) for enhanced pulmonary delivery in the treatment of non-small cell lung cancer (NSCLC). MTX nanosuspensions/nanoparticle (MTX-NP) was developed using PVP-K-30 as polymer and Poloxamer-188 as a stabiliser using various methods. MTX-NP was optimised using a two-factor, three-level Central Composite Design (CCD) and characterised for entrapment efficiency (%EE), drug loading (%DL), Fourier-transform infrared spectroscopy (FTIR), differential scanning calorimetry (DSC), scanning electron microscopy (SEM), X-ray diffraction (XRD), and in-vitro release study. The final optimised batch of Methotrexate Nanoparticles (MTX-NP) showed %EE (71.43 ± 0.31%) and %DL(5.78 ± 0.29%) and converted to MTX-DPI which showed drug content of 96.35%, optimal particle size of 2.98 µm ± 1.51 for inhalation, highest emitted dose (%ED) of 98.74%, mass median aerodynamic diameter (MMAD) of 3.26 µm, geometric standard deviation (GSD) of 1.68 (slightly broader than DPI 2), fine particle fraction (FPF) of 79.42%, and good flowability (Hausner ratio (HR) = 1.13 and Carr's index (CI) = 12.26), DPI-3 (1:6 ratio) has the finest lung deposition of all. The analytical methods showed no chemical interaction between the drug and the polymer. The in vitro cell line study showed dose-dependent inhibition of A549 cells. The developed MTX nanosuspension-based DPI exhibited good aerosolisation characteristics and significant anticancer activity in-vitro, indicating its potential as an effective pulmonary delivery system for NSCLC management.

Link: https://doi.org/10.1007/s44174-026-00698-x

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Crayfish-Optimized Self-Attention Conditional GAN to Enhance Cyber Security in Cloud Computing

AUTHOR :

Gutte V.; Patil D.R.; Idhate S.; Jadhav A.; Satpute S.

JOURNAL NAME:

2025 IEEE 4th International Conference for Advancement in Technology, ICONAT 2025

DETAILS:

Published on September 2025

ABSTRACT:

Distributed as well decentralized architecture in cloud computing encourages uptake and expansion in a number of socioeconomic sectors, including as business, government, education, entertainment, and information technology. Numerous technological services are offered by cloud computing (CC). However, there are serious issues with security and privacy when it comes to cloud storage of large data. A Crayfish-Optimized Self-Attention Conditional GAN is proposed in this research to improve security of the Cloud Computing environment in order to overcome these problems. The database NSL-KDD is used as input data for preprocessing using the Reformed PCVRCF (Phase Conserving Vibrant Range Compression filter) to replace missing values and remove cloud data termination. Feature selection is made easier by preprocessing findings, and the best features finds with MRFOA (Manta Ray Foraging Optimization Algorithm). After classifying cloud data in either normal or abnormal, the SACGAN identifies Various kind of attacks such as U2R-User to Root, R2L - Remote to Local, DoS - Denial of Service and Probe. The SACGAN classifier is further optimized by the Crayfish Optimization Algorithm (COA) for accurate anomaly identification. The suggested method is put into practice in Python and assessed using a number of metrics. In comparison to current approaches, it offers better detection accuracy, shorter calculation times, improved scalability, greater AUC, and a lower detection error rate.

.Link:
https://doi.org/10.1109/ICONAT66879.2025.11362436

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

An Explainable AI Framework for Diabetes Prediction: A Comparative Study of Machine Learning Classification Algorithms

AUTHOR :

Alisetty K.; Bhoite S.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-2)

DETAILS:

Published on 2025

ABSTRACT:

Notwithstanding developments in healthcare technology, diabetes still presents a major worldwide health issue. Its complicated character, impacted by both lifestyle and physiological elements, demands creative, data-driven solutions to promote early discovery and efficient management. In this study, we provide a thorough machine learning (ML) a framework improved with Explainable Artificial Intelligence (XAI) to forecast diabetes starting point with both great accuracy and interpretability. We assessed three supervised ML models using a dataset comprising more than 100,000 medical records: XGBoost, RF, DT, and Logistic Regression (with L1 and L2 regularization). Among these, XGBoost had the greatest performance with a cross-valuation accuracy of 97.08% and a test accuracy of 97.09%. We utilized local interpretable model-agnostic explanations (LIME) and SHapley additive explanations (SHAP) to guarantee openness in the predictions of the model. HbA1c was found by SHAP analysis to be the most important predictor; followed by blood glucose, age, and BMI. LIME revealed unique predictions, verifying that high HbA1c and glucose levels are strong markers of diabetes risk, covariates like smoking history and age exhibit-ed different influences depending on the case. SHAP and LIME presented complementing insights together: global trends from SHAP and instance-specific explanations from LIME, hence improving the general interpretability of the model. Our results show that transparent, reliable, clinically valuable tools for diabetes prediction can result from integrating strong ML models with XAI methods.

Link:
https://www.scopus.com/pages/publications/105034906998?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

3D Manifestation of the Positions for a Cricketer with Pose Matrix

AUTHOR :

Bhoyar S.; Takle V.; Shankar T.N.

JOURNAL NAME:

Proceedings of the 2026 6th International Conference on Image Processing and Capsule Networks, ICIPCN 2026

DETAILS:

Published on January 2026

ABSTRACT:

Transforming a 2D RGB image into a 3D model for the precise representation of any pictorial object, using the image-to-lixel regression policy. This converts a 2-D object into a 3-D framework and addresses the ambiguity of the intended position by elevating it to a higher dimension, thereby forming the expected with the better manifestation of the indiscernible positions. A Convolutional Neural Network is useful for extracting features of body position in preparation for the Skinned Multi-Person Linear model to create accurate physical meshes in the standard RGB format, by neglecting depth sensors. This paper focuses on the PoseMatrix, which is appropriate for fitness coaching, virtual avatars, capturing real-time motion, telehealth, sportsman and cricketer position detection for fair decision-making as a durable and expected real-time solution.

Link: https://doi.org/10.1109/ICIPCN67432.2026.11438655

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Retraction Note: Fraud detection and prevention by face recognition with and without mask for banking application (Multimedia Tools and Applications, (2024), 84, 2, (781-804), 10.1007/s11042-024-19021-1)

AUTHOR :

P.K R.; Khaparde A.; Bendre V.; Katti J.

JOURNAL NAME:

Multimedia Tools and Applications (Vol.-85, Issue-4)

DETAILS:

Published on 15 April 2026

ABSTRACT:

The Publisher has retracted this article in agreement with the Editor-in-Chief. Following publication, this article was found to contain multiple instances of non-standard phrases, also known as tortured phrases, in place of expected well-established phrases [1]. The Editor-in-Chief therefore no longer has confidence in the reliability and provenance of this article. The authors have not responded to correspondence regarding this retraction.

Link: https://doi.org/10.1007/s11042-026-21574-2

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

EEG-Powered Brain-Computer Interface for 3D Hand Gesture Control

AUTHOR :

Dabade K.; Singh L.; Advani S.; Chandak M.; Chunawale A.

JOURNAL NAME:

2025 2nd International Conference on Integration of Computational Intelligent System, ICICIS 2025

DETAILS:

Published on September 2025

ABSTRACT:

EEG is widely used in Brain Computer Interfacing (BCI) applications. This work aims to develop an EEG-powered BCI model that translates neural signals associated with hand movements into control mechanisms for a 3D hand model simulation. This study focuses on developing a simulation environment where the 3D hand model reacts to cognitive commands based on pre-processed EEG data. The Emotiv EEG headset is used by the system to record raw brainwave data, with a special emphasis on motor imagery signals associated with hand movements. Nine volunteers, aged 20 to 22 years, had their brain waves captured using Emotiv EPOC X 14 channel EEG headset. Four different hand gestures - fist open, fist close, index and victory - were considered. A full processing pipeline was implemented, which included data collection, preprocessing, feature extraction and model creation for accurate classification. The EEG data was then mapped to a 3D hand model in Blender tool to simulate movement. The classification of EEG-based motor imagery gestures was done using Multilayer Perceptron that achieved a test accuracy of approximately 96.6 % and the KNN classifier that reached 97.63 % cross-validation accuracy, outperforming other traditional models. Future work will focus on real-time processing and implementation, integrating mechanical and robotic components for practical applications. By providing an intuitive, hands-free method for controlling virtual systems through cognitive commands, the project demonstrates the feasibility of BCI technologies in enhancing user interaction with digital environments.

Link: https://doi.org/10.1109/ICICIS65613.2025.11371126

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

AI-driven audio-to-video generation for dynamic content creation via stable diffusion and CNN-augmented transformers

AUTHOR :

Dharrao D.; Dharrao M.; Padgaonkar S.; Kumari S.; Sreevaishnavi P.S.; Pise P.; Bongale A.

JOURNAL NAME:

Scientific Reports (Vol.-16, Issue-1)

DETAILS:

Published on 24 February 2026

ABSTRACT:

Translating spoken words into emotionally and contextually aligned video content remains an open challenge in generative AI. Subtle vocal patterns—such as pauses and pitch modulations—often obscure emotional cues, resulting in visuals that feel emotionally disconnected or flat. While several models excel at text-to-image generation, they struggle with interpreting speech-based inputs, often misreading paralinguistic cues and contextual intent. To address these limitations, this research introduces EchoVid, an audio-to-video synthesis model designed to prioritize contextual fidelity and emotional alignment. A scalable web interface built with React.js and TypeScript connects to Node.js backend with the MongoDB Atlas for near-real-time generation (≈ 1.2× input-duration latency at 512^2 frames on RTX A4000) interaction. Using PyAudio input, EchoVid guides Hugging Face's Stable Diffusion v2.1 via emotion-aware prompts, with CNN-enhanced diffusion transformers supporting the video generation process. Preliminary results show that EchoVid can generate visuals that reflect both emotional tone (e.g., joyful imagery for upbeat speech) and context. The proposed EchoVid model is compared with MoCoGAN and Stable Video Diffusion variants based on metrics like, FVD, FID-VID and CLIPScore. Further this research introduces two novel evaluation metrics namely Temporal Semantic Stability (TSS) and Perceptual Flicker Index (PFI) that scores the semantic consistency and frame-to-frame change in the generated video. The results show that EchoVid outperforms the other models and can generate relatively better videos.

Link: https://doi.org/10.1038/s41598-026-38758-3

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Quantum Machine Learning for Breast Cancer Detection: A Comparison with Classical Machine Learning Techniques

AUTHOR :

Joshi P.; Saxena A.

JOURNAL NAME:

2025 2nd International Conference on Integration of Computational Intelligent System, ICICIS 2025

DETAILS:

Published on September 2025

ABSTRACT:

Quantum computing promises to revolutionize fields reliant on complex data processing, such as medical diagnostics. This paper presents an extended comparative analysis of classical and quantum machine learning (QML) techniques for breast cancer detection, using the Wisconsin Diagnostic Breast Cancer (WDBC) dataset. Classical kernel-based Support Vector Machines (SVMs) and Quantum Support Vector Classification (QSVC) using IBM's Qiskit platform are employed. Beyond accuracy comparisons, this study provides insights into the technical challenges of quantum feature encoding, computational overheads, and hardware limitations. Results suggest that while classical models currently dominate, QML represents a credible future pathway for handling large-scale, complex medical datasets.

Link: https://doi.org/10.1109/ICICIS65613.2025.11371094

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Plant Disease Detection using CNN

AUTHOR :

Vaidya R.; Nawale S.; Jagtap J.; Kawade P.; Karkar M.; Pujeri U.

JOURNAL NAME:

16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025 (Vol.-1)

DETAILS:

Published on 2025

ABSTRACT:

Diseases that infect plants and crops pose a substantial threat to agricultural productivity within a nation. Traditionally, farmers or experts monitor plants closely to detect and identify diseases, a process often characterized by its time-consuming nature, high cost, and lack of precision. A common method for plant disease detection involves visually inspecting the leaves of diseased plants for characteristic spots. The aim of this research is to develop a Disease Recognition Model using leaf image classification to improve the effectiveness of disease detection. Employing image processing techniques, we deploy a Convolutional Neural Network (CNN) to detect plant diseases. CNNs are a specialized type of artificial neural network designed for analyzing pixel input and are commonly used in tasks related to image recognition.

Link:
https://www.scopus.com/pages/publications/105034176735?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Machine learning–driven insights into nano fly ash synergy for advanced mortar performance optimization

AUTHOR :

Krishnaraj L.; Nakkeeran G.; Shinde S.N.; Thenmozhi S.; Alaneme G.U.; Bakare M.S.; Esenogho E.

JOURNAL NAME:

Discover Applied Sciences (Vol.-8, Issue-3)

DETAILS:

Published on January 2026

ABSTRACT:

The research examines the potential of employing nano technology to modify the physical characteristics of fly ash and improve the engineering performance of mortar. Utilizing Nano Fly Ash (NFA) as a substitute for cement at different ratios demonstrated that the meticulous approach impacted the sample size and surface area, but did not alter the chemical structure and constituents. The analysis of X-ray diffraction (XRD) indicated a reduction in particle size and a complex lattice phase strain in the Fly Ash nanoparticles. The analysis showed that the particles exhibited non-spherical shapes and dimensions measuring under 5 μm. The results of the compressive strength test indicated that the mortar with 15% Nano Fly Ash replacement exceeded the control mortar. Moreover, it was demonstrated that machine learning algorithms can accurately forecast experimental data and the connections between variables, as evidenced by metrics such as Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and the coefficient of determination (R2). The RSM model demonstrated a high level of accuracy in predicting the mechanical properties, achieving a degree of precision with R2 values equal to or greater than 0.9539. The ANN model showed its capability to capture the variability of the data, as shown by a robust R2 threshold ($R2 > 0.9995$) across training, testing, and validation phases. Utilizing high volumes of Fly Ash allows for the conservation of renewable resources, reduction of carbon emissions in cement production, and effective management of the disposal and contamination of inland Fly Ash.

Link: https://doi.org/10.1007/s42452-026-08296-8

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Development of variable buoyancy system for remotely operated vehicles

AUTHOR :

Yadav A.; Halbe A.; Dhavale S.; Borikar G.; Patwardhan S.

JOURNAL NAME:

AIP Conference Proceedings (Vol.-3369, Issue-1)

DETAILS:

Published on 18 March 2026

ABSTRACT:

The work focuses on developing a variable buoyancy system for an unmanned exploration unit at the Centre for Subsea Engineering Research. The design process involved a thorough investigation into pneumatic actuation principles, buoyancy dynamics, and the operational requirements of underwater vehicles. A concept was developed to enable precise buoyancy regulation by manipulating the volume of air within the vehicle's chambers. The study was conducted in three phases to gain an understanding of buoyancy systems. In the first phase, it was observed that a 10 millilitres air gap within a 1-litre capacity bottle was sufficient to keep the bottle afloat on the water's surface. In the second phase, a central mass was added to the system, and the placement of water determined the submersion depth of the system. In the third phase, a prototype was built with pneumatic actuation, where water displacement was electronically controlled via a tether. The prototype was tested in the subsea tank available at the university.

Link: https://doi.org/10.1063/5.0317439

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Comparative Analysis of Deep Learning Techniques in Alzheimer's Disease Diagnosis: Trends, Challenges, and Future Directions

AUTHOR :

Naik, DR; Savyanavar, A

JOURNAL NAME:

METHODSX (Vol.-16)

DETAILS:

Published on 21 February 2026

ABSTRACT:

Alzheimer's disease is a slow, progressive neurological disorder that impacts the brain tissue and causes cells to die, the most common reason for dementia. It typically reduces brain volume, subsequently impairing several cognitive functions. We explored the phases of Alzheimer's disease diagnosis by thoroughly analysing the paper and highlighting the significance of preprocessing methods. Artificial intelligence progress has transformed medical image analysis by enabling automatic, precise identification of Alzheimer's disease through hybrid architectures, convolutional neural networks, and transfer-learning-based models. This article includes applications of Alzheimer's disease based on datasets, Artificial Intelligence models, limitations, preprocessing methods, challenges, and current research in this area. The article lists various medicinal modalities, risk factors for Alzheimer's disease, the disease's progression stages, and different criteria for evaluating the performance of Artificial Intelligence models. Accuracy, precision, confusion matrix, AUC, F1-score, ROC, recall, and MCC are some of the metrics covered in this paper. The paper discusses the number of comparisons of various deep learning techniques for Alzheimer's, new trends, limitations, recommendations, and future directions. Finally, the paper shows the ongoing practical outcomes and difficulties in Alzheimer's situations. Building on the analysis, this survey helps to cover different dimensions of Alzheimer's disease that have not been previously considered.

Link: https://doi.org/10.1016/j.mex.2026.103844

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Experimental investigation of a sustainable natural convection solar air dryer with an internally ringed finned tube

AUTHOR :

Nayak, RC; Kulkarni, MV; Behera, VM; Shende, PN; Shekar, K

JOURNAL NAME:

Environmental Progress & Sustainable Energy

DETAILS:

Published on 24 April 2026

ABSTRACT:

The purpose of this study is to design, fabricate, and experimentally evaluate a sustainable natural convection solar air heating system suitable for passive drying and heating applications without the use of auxiliary power sources. A natural convection solar air heater was developed using a rectangular wooden enclosure integrated with a circular tube fitted with internally placed triangular cross section rings to enhance heat transfer and air mixing. A thin aluminum plate supporting a black coated V shaped absorber was positioned above the tube to effectively capture solar radiation. A transparent glass cover was used to minimize convective and radiative heat losses. Experiments were conducted under inlet air temperatures of 28-32 degrees C and solar radiation intensities ranging from 610 to 950 W/m2. Key parameters such as tube surface temperature, outlet air temperature, buoyancy driven mass flow rate, and instantaneous thermal efficiency were evaluated. The results show that the internally ringed finned tube significantly enhances convective heat transfer compared to a smooth tube due to improved turbulence and secondary flow formation. The natural convection mass flow rate increased by approximately 25-30%, while the maximum temperature rise between inlet and outlet air ranged from 18 to 22 degrees C under peak solar radiation. A maximum instantaneous thermal efficiency of about 46% was achieved at peak solar irradiance of 950 W/m2.

Link: https://doi.org/10.1002/ep.70464

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Predictive temperature control of electric two wheeler hub motor using gradient aware neural regulation with degradation tracking and fault tolerant multi condition torque adaptation

AUTHOR :

Deshmukh, S; Lokhande, N; Yeolekar, S

JOURNAL NAME:

Scientific Reports (Vol.-16, Issue-1)

DETAILS:

Published on 13 March 2026

ABSTRACT:

Thermal stress in electric two-wheeler hub motors is a major bottleneck affecting drivetrain reliability, safety, and efficiency-especially under varied terrain, aggressive riding profiles, and sensor reliability degradation. This paper presents a novel Hybrid Gradient-Aware Neural Regulation (GANR) framework designed to enable predictive motor temperature control, real-time thermal degradation monitoring, and fault-tolerant torque shaping. The system integrates three distinct yet interlinked control layers: (i) gradient-sensitive neural temperature estimation, (ii) cumulative thermal damage indexing through a Motor Health Index (MHI), and (iii) multi-condition torque derating logic that adapts to ambient temperature, health state, and usage intensity. The controller combines a physics-based thermal model with a lightweight neural network estimator capable of learning under sensor drift, latency, or complete failure. A fallback and safety-mode flowchart ensure robust operation by switching to boundary-scaled torque caps and enabling a real-time decision layer that balances energy consumption, performance demand, and thermal safety. The system's intelligence also extends to an ambient-aware derating boundary and a thermal margin estimator to prevent runaway heating events. A detailed simulation framework is developed using real vehicle specifications, encompassing city, aggressive, and worst-case thermal cycles. Results reveal that the proposed control system can delay torque derating by up to 14%, improve energy efficiency by similar to 7.4%, and achieve prediction RMSE below 2.1 degrees C even under multiple sensor fault scenarios. In addition, a full real-time deployment analysis is presented using a mid-tier embedded platform with CPU-cycle, memory, and scheduling footprint assessments. This study offers an original, fault-resilient, and hardware-feasible solution to a largely unaddressed domain-intelligent thermal-aware torque control in electric two-wheelers, creating a new pathway toward smarter, safer, and more robust electric mobility systems.

Link: https://doi.org/10.1038/s41598-026-37505-y

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Targeting the Apelin-APJ Axis: A Promising Strategy to Mitigate Anthracycline-Induced Cardiotoxicity

AUTHOR :

Desai, VG

JOURNAL NAME:

Cardiovascular Toxicology (Vol.-26, Issue-5)

DETAILS:

Published on 17 April 2026

ABSTRACT:

Anthracycline-induced cardiotoxicity remains a major clinical challenge, often progressing to heart failure years after therapy. Conventional cardioprotective agents, including angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, and beta-blockers, are widely used to preserve cardiac function; however, their effectiveness is limited by their inability to comprehensively address the complex, multifactorial pathophysiology of anthracycline-induced cardiotoxicity. This underscores the critical need for more effective and mechanism-based cardioprotective strategies that directly target the underlying molecular mechanisms, particularly oxidative stress and mitochondrial dysfunction. In recent years, the apelin-APJ signalling axis has attracted increasing attention as a potential therapeutic target in cardiovascular diseases owing to its multifaceted biological actions, including positive inotropy, vasodilation, anti-inflammatory, anti-fibrotic, anti-apoptotic, antioxidant, and pro-angiogenic effects. These pleiotropic actions are primarily mediated through the activation of key signalling pathways such as phosphoinositide 3-kinase/protein kinase B, extracellular signal-regulated kinases 1/2, and AMP-activated protein kinase. Given that these signalling cascades are disrupted during anthracycline-induced cardiotoxicity, pharmacological activation of the apelin-APJ axis may represent a promising avenue to mitigate anthracycline-associated cardiac injury with greater efficacy than conventional therapies. While native apelin isoforms (apelin-12, -13, -17, and [Pyr & sup1;]apelin-13) are limited by their short half-lives, chemically modified analogues such as LIT01-196 and apelin-17(A2) exhibit enhanced stability and efficacy, with demonstrated cardioprotective effects in preclinical cardiovascular models and patients with chronic heart failure.

Link: https://doi.org/10.1007/s12012-026-10107-w

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Design and development of the multispectral sensor with CIE Tristimulus colorimetry and machine learning framework for organic/non-organic tomato classification

AUTHOR :

Aher, TA; Shaligram, AD; Patil, SS; Shukre, VA

JOURNAL NAME:

Organic Agriculture (vol.-16, Issue-2)

DETAILS:

Published on 23 April 2026

ABSTRACT:

The differentiation of organic and non-organic produce is vital for trust and compliance. This research proposes a simple, non-destructive pipeline that combines Tristimulus Colorimetry with Machine Learning using the Portable Multispectral Sensor (VIS-NIR) to classify organic vs non-organic Tomatoes. Spectral reflectance from tomatoes (Organic, Non-Organic) collected under D65 was converted to CIE X, Y & Z, chromaticity (x, y), dominant wavelength, purity, NDVI, PRI, and two CIE-plane descriptors relative to a standard color anchor i.e. Radial shift (Delta r) and angular shift (Delta theta). Supported by Vector Machines, Random Forests, and a lightweight CNN were trained with grid search and ten (10) fold cross-validation. The CNN performed best (Result: greater accuracy and greater F1 value for organic produce) and generalized to an external set of various organic & non-organic tomatoes (Result: greater accuracy for organic produce). Machine Learning Model interpretation indicated the Tristimulus features were most influential (similar to 65%) Misclassifications were rare and occurred mainly at early ripening, where organics showed higher y-chromaticity (i.e. Greater chlorophyll retention) The method enables fast, low-cost field authentication without chemical analysis and is ready for sensor-embedded deployment.

Link: https://link.springer.com/article/10.1007/s13165-026-00556-6

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Experimental Investigation of Surface Integrity Analysis Using Machine Learning for Nano-Powder Mixed Electrical Discharge Machining

AUTHOR :

Kaigude, AR; Khedkar, NK; Jatti, VS

JOURNAL NAME:

Journal Of Manufacturing And Materials Processing (Vol.-10, Issue-4)

DETAILS:

Published on 28 March 2026

ABSTRACT:

This research investigates the optimization of surface integrity in powder-mixed electrical discharge machining (PMEDM) through the innovative use of Jatropha biodielectric fluid enhanced with titanium dioxide (TiO2) nanoparticles. A comprehensive experimental framework was developed using design expert software (DOE) with Response Surface Methodology (RSM) to systematically analyze the machining of AISI D2 tool steel using copper electrodes. The study examined five critical process parameters, gap current (Ip), pulse-on duration (Ton), pulse-off time (Toff), gap voltage (V), and powder concentration, evaluating their combined effects on surface roughness (SR), surface crack density (SCD), and residual stress characteristics. Advanced characterization techniques including scanning electron microscopy (SEM) were employed to analyze surface topography and subsurface microstructural changes. The optimization process successfully identified optimal machining conditions of current = 9 A, Ton = 100 & micro;s, Toff = 10 & micro;s, and gap voltage = 65 V, achieving exceptional surface quality with a minimum surface roughness of 3.22 & micro;m. Remarkably, these optimized parameters resulted in crack-free surfaces with zero surface crack density and minimal residual stress values across the 2 theta range of 90 degrees to 180 degrees. To enhance predictive capabilities, supervised machine learning algorithms were implemented to model surface roughness behavior. Comparative analysis of classification algorithms demonstrated that Support Vector Machine (SVM), k-Nearest Neighbors (kNNs), and Gaussian Na & iuml;ve Bayes achieved superior performance with F1-scores of 0.88 and prediction accuracies of 90%.

Link: https://doi.org/10.3390/jmmp10040115

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Biometric authentication systems: Trends, challenges, and future prospects - A comprehensive review

AUTHOR :

Kakade, S; Raut, U

JOURNAL NAME:

METHODSX (Vol.-16)

DETAILS:

Published on April 2026

ABSTRACT:

With cyber security concerns high on the list of issues, it is no surprise that demand for secure confidentiality for all users and objects is at an all-time high; at the same time, the development of robust reliable systems for providing confidentiality is also at an all-time high due to the increasing degree of use of the internet. Systems will utilize the authenticated user identifying that combines both provided user identifying information with data stored in a secure database. Traditional authentication methods (passwords and pin numbers) have been proven inadequate to provide robust security and improve user experience with the rise of cyber security threats. Individual unimodal biometric systems face multiple challenges. For this reason, a multi biometric authenticating system (using more than one biometric characteristic) would be a viable solution to the limitations of unimodal biometric authentication systems by providing greater robustness and reliability to the authentication process. Multimodal biometric authentication systems leverage several biometric traits, to boost the security and accuracy of identity verification. The proposed system has four major components such as preprocessing, feature extraction, feature fusion, and authentication. By merging data from multiple modalities, these systems get around the limitations of unimodal biometric systems.

Link: https://doi.org/10.1016/j.mex.2026.103908

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Design, Development, and Performance Evaluation of Mechanical Time Delay Mechanism Integrated with Material Handling System for Effective Potato Quality Testing and Sorting

AUTHOR :

Ardak, MB; Phate, MR; Sathe, A

JOURNAL NAME:

Potato Research (Vol.-69, Issue-4)

DETAILS:

Published on 28 April 2026

ABSTRACT:

Post-harvest potato grading and quality assessment requires sufficient and controlled time delays to ensure accurate evaluation of defects, physiological changes, and export suitability. Conventional grading systems often lack reliable mechanisms to provide variable testing times, which limits consistency in quality control. To address this challenge, the present study develops and integrates a mechanical time delay system with an agricultural material handling unit to enable precise and adjustable delays during potato testing and sorting. The system employs a novel escapement mechanism with pallet-escape wheel arrangements, designed to improve accuracy, durability, and reliability under agricultural conditions. Experimental evaluation was carried out using response surface methodology (RSM) with Taguchi's L18 mixed plan to optimize parameters such as angular twist, pallet weight, and torque. Results indicate that the maximum time delay of 57.99 min is achieved at an angular twist of 280 degrees, pallet weight of 590 mg, and torque of 85 N & centerdot;mm. The system demonstrates flexibility, allowing delays from 30 s to nearly 58 min, depending on operational requirements. This novel approach enhances the efficiency of potato quality testing and sorting, ensuring better compliance with export standards and contributing to improved post-harvest management in the agricultural sector.

Link: https://doi.org/10.1007/s11540-026-10060-9

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Encapsulation of Fe-doped BCZTO hybrid material with PANI for enhanced photocatalytic dye degradation efficiency and computational assertion of the composite

AUTHOR :

Naresh, G; Neikha, K; Baruah, S; Das, P; Puzari, A

JOURNAL NAME:

International Journal Of Polymer Analysis And Characterization (Vol.-31, Issue-4)

DETAILS:

Published on 11 November 2025

ABSTRACT:

Ferroelectric oxides, prized for their dielectric, piezoelectric, and optical properties, have surged in interest. Barium calcium zirconate titanate (BCZTO) is widely used in electronics, either as single crystals or ceramics, with enhanced permittivity achievable through doping for capacitor applications. Encapsulating these with conductive polymers exploits synergies, broadening their utility. This study synthesizes and characterizes PANI-encapsulated Fe-doped BCZTO hybrids with varying Fe-BCZTO proportions, showing promise in degrading dyes. The structural analysis via FT-IR, UV-Vis, XRD, SEM, and TGA confirms successful Fe doping and filler integration. Thermal stability improves with higher Fe-BCZTO weights in the composite. The material demonstrated efficacy in the photocatalytic degradation of methylene blue dye. Additionally, interaction studies of the composite were supported by density functional theory computations.

Link: https://doi.org/10.1080/1023666X.2025.2580940

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Published on April 2026

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