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RESEARCH PAPERS

February-2026

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A flexible laplace–gamma compound distribution for modeling reliability and risk data

AUTHOR :

Ranade, S.; Rather, A.A.; Farhat, Y.

JOURNAL NAME:

Discover Artificial Intelligence (Vol.-6, Issue-1)

DETAILS:

Published on 14 February 2026

ABSTRACT:

In this article, we introduce a new form of compound distribution by combining Gamma and Laplace components. This new distribution is specifically designed to address the limitations of traditional models when dealing with skewed and heavy tailed data. Its flexible parameters enable precise control over tail heaviness and data concentration, making it adaptable to assorted data behavior common in finance, insurance, and engineering. Additionally its balanced decay mechanism ensures symmetrical treatment of extreme values, enhancing accuracy in modeling risks and uncertainties, ultimately supporting more robust decision-making in high-stakes environments. A detailed analysis of the unique structural properties of this newly proposed model is carried out, including probability density function (PDF), cumulative distribution function(CDF), survival function, hazard function, moments, parameter estimation, tail behavior analysis, ordered statistics, and risk measures.

Link: https://doi.org/10.1007/s44163-026-00858-4

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Energy-efficient refrigeration cycle strategies for capacity improvement and humidity control in VRF systems

AUTHOR :

Elgandelwar, A.M.

JOURNAL NAME:

International Journal of Air-Conditioning and Refrigeration (Vol.-34,

DETAILS:

Published on 10 February 2026

ABSTRACT:

The growing demand for energy-efficient and environmentally sustainable HVAC solutions in residential buildings has driven the adoption of Variable Refrigerant Flow (VRF) systems. VRF technology, typically using R410A as the working fluid, provides simultaneous heating and cooling with enhanced part-load efficiency and greater operational flexibility than conventional central air conditioning systems. This study aims to optimize the refrigeration cycle of a VRF high wall indoor unit to improve cooling capacity and dehumidification performance. A combination of experimental and analytical methods was employed to evaluate system behavior under varying ambient temperatures and load conditions. Special emphasis was placed on assessing resistance to surface condensate formation (sweating), which is prevalent in high-humidity environments. Results indicate that specific cycle enhancements can significantly increase capacity utilization and improve control over dew point conditions. These improvements suggest that optimized VRF systems can better meet thermal comfort and moisture regulation requirements, particularly in tropical and sub-tropical climates where both energy efficiency and humidity control are critical.

Link: https://doi.org/10.1007/s44189-026-00098-2

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Evaluating AI-driven credit scoring models versus traditional statistical techniques

AUTHOR :

Vakrani, D.S.; Padhye, P.S.; Gupta, S.K.; Roy, J.K.; Nerlekar, V.S.; Parashar, N.

JOURNAL NAME:

Discover Artificial Intelligence (Vol.-6, Issue-1)

DETAILS:

Published on 27 December 2025

ABSTRACT:

This study evaluates AI credit-scoring models against standard statistical models using a real-life data set with 1000 loan applications. The main research question is about whether machine-learning methods are more valuable in terms of predictive accuracy, interpretability and stability to changes in the process of macroeconomic deterioration as compared to traditional methods. The four model variants were developed: the logistic regression and decision tree as examples of the classical ones, and XGBoost gradient-boosting ensemble and multilayer perceptron neural networks as examples of AI-based alternatives. The methodological engine was R (v4.3.1), which established a 70:30 train-test strata union, inner cross-validation and harmony spatial search to tune the hyperparameter. The findings show that XGBoost produces an optimal balanced accuracy cumulative gain curve (cumulative gain, CGC: 0.89; area under the receiver operating characteristic, AUC: 0.89) that is trumped by the neural network (CGC: 0.87; AUC: 0.87) and succeeded by the logistic regression (CGC: 0.76; AUC: 0.76). The SHAP analysis shows that the amount of credit, duration of loan, and age are central predictors. During stress-test simulation, XGBoost is stable in making predictions (AUC = 0.83) compared to a severe decline in logistic-regression results (AUC = 0.68). The results therefore justify the claim that the state-of-the-art AI tools have better predictive potential and robust interpretability, thus rising as viable alternatives to the systems in vogue in modern finance organisations.

Link: https://doi.org/10.1007/s44163-025-00772-1

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Bright photorefractive solitons supported by simultaneous linear and quadratic electro-optic effect with both drift and diffusion charge transport

AUTHOR :

Katti, A.; Ziółkowski, A.

JOURNAL NAME:

Chaos, Solitons and Fractals (Vol.-207)

DETAILS:

Published on 29 January 2026

ABSTRACT:

We have predicted a new and large family of optical spatial solitons in photorefractive crystals having both linear and quadratic electro-optic effects by considering for the first time an equal significance of both drift and diffusion on the charge transport. We solve the ensuing modified Nonlinear Schrödinger equation employing the paraxial approximation in conjunction with a variational solution. Consequently, we have derived the existence curve of solitons together with the evolution equations for soliton width and deflection. Bistable states have been found, revealing two threshold powers for soliton generation associated with a certain soliton width. Distinct power regimes have been identified on this basis, and the evolution of soliton breadth and self-deflection has been examined within these contexts. The external electric field affects the soliton trajectory, with self-deflection escalating as the electric field intensifies. The interaction between the linear and quadratic electro-optic effects has been examined by analyzing two scenarios: one in which the linear electro-optic effect predominates, and another in which the quadratic effect prevails. We analyze and differentiate the impact of each electro-optic effect on the existence curve of solitons and their trajectories.

Link: https://doi.org/10.1016/j.chaos.2026.117940

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Engineering magnetite (Fe3O4) nanoparticles: Controlled synthesis, surface functionalization, and multidisciplinary technological applications: A Review

AUTHOR :

Kohale, M.; Inamdar, H.; Kokate, K.; Ingale, R.; Joshi, J.; Singh, D.; Katti, A.; Satish, S.; Aher, R.; Kulkarni, S.

JOURNAL NAME:

Progress in Crystal Growth and Characterization of Materials (Vol.-72, Issue-1)

DETAILS:

Published on 23 January 2026

ABSTRACT:

Magnetite (Fe3O4) nanoparticles have garnered significant attention due to their small size and high surface area, biocompatibility, and magnetic properties. This review offers an insightful and comprehensive discussion of recent advances in synthesis techniques and their impact on nanoparticle formation and characteristics. The diverse applications of Fe3O4 nanoparticles in medicine, modern photonics, energy storage, biosensing, catalysis, and environmental remediation are examined. Additionally, surface functionalization strategies designed to enhance stability, biocompatibility, and application-specific reactivity are outlined. Finally, current limitations are discussed with an outline for future research directions along with concluding perspectives on the continued development of Fe3O4 nanoparticle technologies.

Link:
https://www.sciencedirect.com/science/article/pii/S096089742600001X

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Geriatric syndromes, comorbidities, and polypharmacy: Determinants of health-related quality of life in hospitalized older adults in South India

AUTHOR :

Syed, J.; Pereira, P.; Tejeswini, C.J.; Avarebeel, S.; Ramesh, K.; Undela, K.; Ramesh, M.; Chalasani, S.H.

JOURNAL NAME:

Geriatric Nursing (Vol.-69)

DETAILS:

Published on 14 February 2026

ABSTRACT:

Background: As the older adult population grows, there is an increasing need to understand how geriatric syndromes and comorbidities affect the health-related quality-of-life (HRQoL). This study aimed to examine the relationships among geriatric syndromes, comorbidities, polypharmacy, and HRQoL in hospitalized older adults.

Methods: This cross-sectional study was conducted over 14-months in a tertiary care hospital and included patients aged ≥60 years. HRQoL was assessed using the EQ-5D-5 L questionnaire, and geriatric syndromes were assessed using validated tools. Multivariate linear regression analysis was used to identify factors associated with HRQoL.

Results: Among 597 patients (mean age 72.80 ± 7.41 years), the mean EQ-5D-5 L index was 0.75 (SD: 0.26), showing significant decline with age ($p = 0.039$). High prevalence rates were observed for frailty (59.30 %), sarcopenia (51.42 %) and cognitive impairment (15.91 %). Comorbidity burden, frailty, and sarcopenia increased with age ($p < 0.001$, $p = 0.016$, and $p < 0.001$, respectively). HRQoL scores were negatively associated with the Charlson Comorbidity Index (CCI) ($p < 0.001$), frailty ($p < 0.001$), sarcopenia ($p = 0.003$), and polypharmacy ($p = 0.041$). Regression analysis showed that the No of comorbidities ($p = 0.009$), CCI ($p = 0.015$), length of hospital stay ($p = 0.022$), and sarcopenia ($p = 0.009$) negatively affected HRQoL, whereas cognitive impairment ($p = 0.037$) had a positive association.

Conclusion: Although this study identified significant associations between geriatric syndromes and HRQoL, its cross-sectional nature precludes the establishment of causal-relationships. Longitudinal studies should further examine these relationships to develop effective intervention strategies that may improve geriatric care outcomes.

Link:
https://www.sciencedirect.com/science/article/abs/pii/S0197457226001564

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TITLE:

Integrated in Vitro and in Vivo Assessment of Rhus succedanea for Protection against Paracetamol-Induced Nephrotoxicity

AUTHOR :

Pujari, R.; Dange, A.

JOURNAL NAME:

Journal of Pharmaceutical Innovation (Vol.-21, Issue-2)

DETAILS:

Published on 9 February 2026

ABSTRACT:

Paracetamol (PCM) is a widely used analgesic and antipyretic; however, prolonged or excessive exposure is associated with nephrotoxicity mediated by oxidative stress and renal tubular injury. Despite the availability of interventions such as N-acetylcysteine in acute paracetamol toxicity, effective and targeted therapies for paracetamol-induced nephrotoxicity remain inadequate, leading to increased investigation of herbal-based therapeutic options. The present study investigated the nephroprotective potential of the hydroalcoholic extract of Rhus succedanea Linn. whole plant (RSE) against PCM-induced nephrotoxicity using integrated in vitro and in vivo approaches. Cytotoxicity and cytoprotective effects of RSE were initially assessed in HEK293 cells using the MTT assay. For in vivo evaluation, sixty male Wistar rats were divided into ten groups (n = 6). Nephrotoxicity was induced by administering PCM (200 mg/kg, intraperitoneally) for 14 days. RSE was administered orally at doses of 200, 400, and 800 mg/kg under preventive and curative regimens, while silymarin (100 mg/kg, p.o.) served as the standard reference drug. Preventive treatment was given concomitantly with PCM, whereas curative treatment commenced after PCM exposure. Renal function was assessed through physiological parameters, urine output, serum biochemical markers, electrolyte balance, oxidative stress biomarkers (SOD, CAT, GSH, and MDA), and histopathological examination of renal tissues. PCM administration caused marked renal dysfunction, oxidative stress, and histological damage. Treatment with RSE significantly and dose-dependently ameliorated PCM-induced alterations, with the highest dose (800 mg/kg) exhibiting nephroprotective effects comparable to silymarin in both regimens. These findings suggest that Rhus succedanea possesses significant nephroprotective activity, likely mediated through antioxidant mechanisms, supporting its potential as a phytotherapeutic candidate for managing drug-induced nephrotoxicity.

Link: https://doi.org/10.1007/s12247-026-10387-3

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TITLE:

Reduced graphene oxide (r-GO) anchored bismuth oxide (Bi_2O_3) nanocomposite material: Fabrication, characterization, photocatalytic degradation of rhodamine B (RB) dye and phytotoxicity study

AUTHOR :

Waghmare, R.C.; Ingale, R.; Raundal, P.G.; Sonawane, P.V.; More, A.D.; Koli, P.B.

JOURNAL NAME:

Inorganic Chemistry Communications (Vol.-186)

DETAILS:

Published on February 2026

ABSTRACT:

The present research work deals with the fabrication of bismuth oxide (Bi_2O_3) nanomaterials by sol gel citrate method and fabrication of reduced graphene oxide (r-GO) by Hammers method using waste dry electric batteries. The nanocomposite of Bi_2O_3 and graphene oxide was prepared cost-effective heat and beat method (Ball Grinding method) followed by ultrasonication and calcination. The prepared materials Bi_2O_3, r-GO and r-GO Bi_2O_3 were Characterized by X-ray diffraction (XRD) technique to investigate the structural parameters. The average crystallite size was calculated from Debye Scherrer formula, the estimated size for Bi_2O_3, r-GO and r-GO Bi_2O_3 was 18.20 nm, 14.30 nm and 21.56 nm respectively. The scanning electron microscopy (SEM) was utilized for morphological parameters of the prepared materials like surface, texture, porosity and dimensions of nanomaterials. The energy dispersive spectroscopy (EDS) technique was utilized to investigate the elemental composition. The lattice parameters and polycrystallinity was confirmed from transmission electron microscopy (TEM) analysis. While the band gap of the fabricated materials was confirmed from ultraviolet diffuse reflectance spectroscopy (UV-DRS). Additionally, the materials were further characterized by photoluminescence (PL) spectroscopy for optical properties such as band gap investigations. The surface area of both the catalyst was investigated by Brunauer-Emmett-Teller (BET) adsorption isotherm. The fabricated materials Bi_2O_3 and r-GO Bi_2O_3 nanocomposite were investigated for the photocatalytic dye degradation study of Rhodamine B (RB) dye and phytotoxicity study. The various parameters of the dye degradation such as catalyst dose, effect of pH, effect of dye concentration, radical scavenging study, contact time and comparative study was investigated for RB dye. The r-GO- Bi_2O_3 nanocomposite has a superior rate of dye degradation, and it degrades the 98.23% of RB dye in 70 min.

Link:
https://www.sciencedirect.com/science/article/pii/S1387700326001498

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TITLE:

High lithium-ion conductivity via tetrazolium-crosslinked gel polymer electrolyte for lithium secondary batteries

AUTHOR :

Kulkarni, U.; Cho, W.-J.; Yoon, J.H.; Shejale, K.P.; Kim, M.P.; Bae, J.-S.; Han, O.H.; Yi, G.-R.

JOURNAL NAME:

Journal of Power Sources (Vol.-668)

DETAILS:

Published on 17 January 2026

ABSTRACT:

Gel polymer electrolytes (GPEs) are effective candidates for developing long-lasting, high-energy-density lithium-ion batteries (LIBs). We present a crosslinked network polymer of poly(acrylonitrile-r-vinylidene diazide) with tethered tetrazolium rings (xPAN+) as highly stable and ion-selective GPEs for lithium-ion batteries. In concert with nitrile and azide groups from acrylonitrile and vinylidene blocks, these cationic rings play a crucial role in facilitating the movement of lithium-ions by interacting with both anions and solvent molecules, similar to single-ion conductors. This structure enables a remarkable lithium transference number (tLi+ = 0.9) and lithium-ion conductivity of 1.67 mS/cm at 30 °C. As a result, xPAN+ GPEs performed stable cycling performance over 2000 h in lithium plating and stripping behavior and maintained discharge capacity retention of 92.15 % in LiFePO4 paired half-cell (141.18 mAh/g at 0.5C over 230 cycles). This work demonstrates a straightforward approach for fabricating ionic polymer-based GPEs that promote superior ion transport and ensure stable electrochemical performance in LIBs.

Link: https://doi.org/10.1016/j.jpowsour.2026.239331

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Effect of sulfonation density on acid strength in ion exchange resins: Insights from solid-state NMR and density functional theory

AUTHOR :

Tumulu, G.N.; Datar, S.; Shelke, A.; Swain, G.; Ajithkumar, T.G.; Raja, R.; Mohan, O.; Mahajani, S.M.

JOURNAL NAME:

Molecular Catalysis (Vol.-593)

DETAILS:

Published on 11 February 2026

ABSTRACT:

Ion-exchange (IE) resins are widely used as solid acid catalysts; however, their surface acidity remains poorly characterized because their limited thermal stability precludes conventional NH_3-based acidity measurements. Moreover, acid-site accessibility in IE resins is strongly governed by solvent- or reactant-induced swelling. Here, we investigate the surface acidity of commercial Amberlyst and Indion IE resins using ^{31}P MAS NMR (Magic Angle Spinning Nuclear Magnetic Resonance), employing TMPO as a molecular probe dispersed on the resin with moderately swelling dichloromethane, thereby capturing the swollen-state acidity relevant for predicting catalytic activity. The deconvolution of the 31P MAS NMR spectra reveals three distinct acid-strength zones arising from inhomogeneous sulfonation of the polymer matrix. The overall acidity, quantified by the area-weighted average 31P chemical shift ( ), increases monotonically with sulfonation density. Notably, only resins containing acid sites stronger than ~80 ppm exhibited measurable catalytic activity in α-pinene isomerization, establishing a direct correlation between acidity and activity. Density functional theory (DFT) calculations on representative resin models, supported by electron-density analyses, attribute the enhancement of acid strength at higher sulfonation densities to cooperative hydrogen-bonding networks among neighboring sulfonic acid groups. Together, these findings establish 31P MAS NMR–derived surface acidity as a catalytically relevant descriptor for the rational selection of IE resins in liquid phase acid-catalyzed chemistries.

Link: https://doi.org/10.1016/j.mcat.2026.115794

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Design, synthesis and biological evaluation of 1H-indazole derivatives as InhA inhibitors and anticancer agents

AUTHOR :

Nanaware, R.B.; Chabukswar, A.R.; Jagdale, S.C.; Khobragade, R.M.

JOURNAL NAME:

Journal of Chemical Sciences (vol.-138, Issue-1)

DETAILS:

Published on 20 February 2026

ABSTRACT:

A series of 1H-indazole derivatives were synthesized using hexafluorophosphate azabenzotriazole tetramethyl uronium (HATU) as a coupling agent and evaluated for their dual biological activity against Mycobacterium tuberculosis (Mtb) and non-small cell lung cancer (NSCLC). Molecular docking and molecular dynamics (MD) simulations identified (2,5-dimethoxyphenyl)-(5-nitro-1H-indazol-1-yl)methanone (compound 11) was the most promising candidate, showing stable binding to the InhA enzyme with a binding energy of −9.76 kcal/mol. Compound 11 exhibited strong antitubercular activity (MIC 3.2 µg/mL), potent cytotoxicity against A549 cancer cells (78.45%), and significant anti-inflammatory effect (92.98% edema inhibition at 12h). Other derivatives also demonstrated noteworthy antimycobacterial and anti-inflammatory properties. Molecular mechanics-generalized born surface area (MM-GBSA) and molecular dynamic simulation (MDS) supported the favourable binding affinities and complex stability of the lead compound. Absorption, distribution, metabolism, and excretion (ADME) predictions confirmed drug-likeness with good gastrointestinal absorption and no violations of Lipinski's rule. The combined in silico and in vitro findings highlight the potential of these indazole-based compounds as dual-acting agents for treating multidrug-resistant tuberculosis and NSCLC. Further in vivo studies and mechanistic investigations are warranted to explore their clinical relevance. It was demonstrated that the synthesized derivatives of 1H-indazole using HATU as a coupling agent showed promising antitubercular, analgesic, anti-inflammatory as well as anticancer activity. The compound NDM showed excellent biological activities.

Link: https://doi.org/10.1007/s12039-025-02468-6

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Aeroacoustic Optimization of UAV Propellers Using Multi-Set Blade Designs and Bio-Mimetic Serrations: A CFD–FW–H Based Investigation

AUTHOR :

Mane, M.V.; Sonawwanay, P.D.; Solanki, M.; Patel, V.

JOURNAL NAME:

Journal of Vibration Engineering and Technologies (Vol.-14, Issue-3)

DETAILS:

Published on 20 February 2026

ABSTRACT:

Urban air mobility and low-altitude UAV operations demand propulsion systems with low acoustic emissions, especially in densely populated and environmentally sensitive areas. Propeller-induced noise remains the primary contributor to UAV sound output. This study investigates the combined effects of blade count and trailing-edge bio-mimetic serrations on tonal and broadband noise generation. Six propeller configurations—single-, two-, and three-blade designs with standard and bio-mimetic serrated edges—were analyzed. Aerodynamic fields were computed using a grid-independent SST k–ω CFD model, and far-field noise was predicted using the Ffowcs Williams–Hawkings (FW-H) acoustic analogy. Standardized geometry and serration parameters ensured consistent comparisons. Increasing blade count reduced dominant tonal noise by improving load distribution, while bio-mimetic serrations disrupted coherent vortices and shifted acoustic energy to higher frequencies. The three-blade serrated configuration produced the lowest sound pressure levels at 2500 Hz and 5000 Hz. Numerical results showed good agreement with published experimental data. This study demonstrates that the combined application of increased blade count and trailing-edge bio-mimetic serrations can significantly enhance acoustic performance in UAV propulsion systems. The unified CFD–FW–H framework provides reliable insights into both tonal and broadband noise mitigation mechanisms. The primary novelty lies in the systematic comparison of blade-number effects and bio-inspired geometries within a consistent modeling environment, offering practical design guidelines for achieving aerodynamic efficiency alongside acoustic stealth in next-generation UAV rotors.

Link: https://doi.org/10.1007/s42417-026-02386-y

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Sustainable finance research frontiers: A hybrid bibliometric–TCCM review

AUTHOR :

Kumar, R.; Kishor, K.; Gulati, A.; Vaibhav; Kumar, R.

JOURNAL NAME:

Development and Sustainability in Economics and Finance (vol.-9)

DETAILS:

Published on 5 February 2026

ABSTRACT:

Employing a hybrid literature review methodology that integrates bibliometric analyses with the TCCM (Theory, Context, Characteristics, Methodology) framework, this research investigates 57 impactful literature reviews pertaining to sustainable finance from topranked ABDC journal. The investigation reveals a notable expansion in academic output from 2019 to 2025. The academic growth reflects increased research efforts aligned with global sustainability goals. Citation analysis reveals that over 84 % of works analyzed have been cited, highlighting their academic importance and creating a foundational knowledge base for future research. Prominent journals and essential documents are identified to facilitate scholarly participation. Geospatial analysis highlights the increasing involvement of developing nations, particularly India as the leading contributor. Nigeria, Vietnam, and Brazil exhibit significant bibliographic collaborations alongside established regions like the United States, the United Kingdom, Germany, and France. Thematic clustering and keyword co-occurrence analysis illuminate nine principal research clusters, which encompass technological innovation, sustainability disclosure, green Sukuk, carbon finance, and impact investing. Clusters such as faith-based finance, climate finance mechanisms, and sustainability accounting indicate a transition toward interdisciplinary inquiry. The study identifies future research requirements through a TCCM framework, advocating for standardized ESG metrics and scalable technologies like blockchain, AI, and IoT in alignment with Sustainable Development Goals (SDGs 9, 12, 13). It urges empirical research on green debt, climate finance, and sustainable investment to bolster climate action and international financial collaboration (SDGs 13, 17).

Link: https://doi.org/10.1016/j.dsef.2026.100122

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Enhanced ASD detection using 3D facial landmark localization with convolutional shape appearance model and graph-randomized XGBoost

AUTHOR :

Attar, N.; Paygude, S.

JOURNAL NAME:

Sadhana - Academy Proceedings in Engineering Sciences (Vol.-51, Issue-1)

DETAILS:

Published on 27 January 2026

ABSTRACT:

Autism spectrum disease (ASD) is a neurological disease that affects social interaction, communication and behaviour, thus early diagnosis is essential for treatment. Existing detection methods, such as 2D face scans and eye tracking data, are ineffective in capturing difficult facial features and minor asymmetries. Hence, this study presents a novel Convolutional Shape Appearance Model with Randomized Trees-based XGBoost to increase the accuracy and reliability of ASD detection using 3D facial landmark localization. Existing methods fail to capture small facial asymmetries and detailed landmarks essential for accurate diagnosis from 3D facial images, which limits the accuracy of diagnosing ASD-related behaviours. To address this, a novel convolutional neural network (CNN) with an active shape appearance model (ASAM) is introduced, which combines the strengths of CNNs in automatically learning intricate facial features from 3D images and ASAM's ability to capture variations in facial shapes and textures, thereby enhancing the feature extraction process and accurate localization of facial landmarks. Furthermore, existing detection methods struggle to integrate and analyse facial asymmetry and the complex interactions between multiple facial features simultaneously, leading to reduced accuracy in detecting ASD. Thus, a Euclidian graph with a Randomized Trees-based XGBoost approach is utilized, which captures spatial relationships between facial landmarks and models complex feature interactions, thereby enhancing the accuracy and reliability of ASD detection. The findings demonstrate that the suggested model offers excellent levels of accuracy, precision, recall, detection accuracy, sensitivity and specificity when compared to other existing models.

Link: https://doi.org/10.1007/s12046-025-03024-1

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Photo-induced oxidative degradation of polystyrene waste by a surface-modified heterogeneous titanium catalyst in air

AUTHOR :

Pal, N.K.; Patra, M.; Gogate, N.; Zele, S.

JOURNAL NAME:

Catalysis Science and Technology (Vol.-16, Issue-4)

DETAILS:

Published on 4 February 2026

ABSTRACT:

A photocatalytic protocol employing a surface-modified heterogeneous TiO2 catalyst is developed for the selective conversion of polystyrene (PS) waste into aromatic ketones or acids in ambient air by tuning pivalic acid (PivOH) loading. Surface modification by Ni reduces the band gap of TiO2 and thereby enhances the visible-light (blue LED) activity of the catalyst. Mechanistic insights suggest superoxide radical-induced C–H activation followed by C–C scission through a photo-hydrogen atom transfer (HAT) pathway. The catalyst exhibits excellent recyclability, offering a sustainable route for PS valorization.

Link: https://doi.org/10.1039/D5CY01469G

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TITLE:

Sustainable Print Management Via Data-Driven Approaches

AUTHOR :

Dhawas, N.; Sonar, R.; Bhandari, M.A.; Wankhade, S.; Ghuge, K.; Shelke, G.C.; Kokane, C.

JOURNAL NAME:

ShodhKosh: Journal of Visual and Performing Arts (Vol.-7, Issue-1s)

DETAILS:

Published on 17 February 2026

ABSTRACT:

Sustainable print management has become an issue of paramount importance in respect to organizations that want to mitigate the effects they have on the environment whilst still being able to operate efficiently. The conventional print management systems tend to be based on fixed set of rules and manual controls hence resulting in wastage of paper, energy and unchecked waste. The research is a proposed comprehensive data-oriented system of sustainable print management, which combines data analytics, predictive modeling, and optimization methods in order to allow intelligent, adaptative, and resource-efficient printing environments. The suggested solution will take advantage of past print logs, device level energy logs, and patterns of user behavior to predict print demand, uncover inefficiencies, and make informed decisions. Predictive models are also used to forecast print volumes in future and possible waste in order to allow proactive measures to be taken like job consolidation, duplex enforcement and digital alternatives. The optimization algorithms also contribute to sustainability by dynamically assigning the print jobs to devices which consume less energy and scheduling workloads to reduce maximum consumption of energy. Moreover, user-friendly analytics is also integrated in order to gain an insight into the printing activity and implement nudging technologies that promote responsible printing without interfering with productivity. The experimental results show that there are quantifiable decreases in the amount of paper, energy use, and print-related emissions in comparison with the traditional systems and serviceable levels are attained. The results show the possibility of the data-driven strategies to make print management more of a proactive sustainability contributor as opposed to an operational reactive mechanism.

Link: https://doi.org/10.29121/shodhkosh.v7.i1s.2026.7114

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

An adaptive authentication approach for optimum security and energy efficiency in WMSN

AUTHOR :

Kulkarni, A.N.; Yadav, A.; Kulkarni, N.S.

.

JOURNAL NAME:

Engineering Research Express (Vol.-8, Issue-4)

DETAILS:

Published on 18 February 2026

ABSTRACT:

The capability of Wireless Military Sensor Networks (WMSNs) to enable highly secure communication between sensor nodes which are essential for various applications, like battlefield oversight, disaster prevention, border security, and environmental monitoring, attracted the researcher community as they effectively preserve tracking in diverse settings. The major challenges associated with WMSNs are restricted bandwidth, transmission delays, limited lifetimes, and security threats. Although with the validation of sensor node authenticity, it is crucial to ensure secrecy, minimize overheads, conserve battery, and defend against attacks like wormhole, sybil, and impersonation. In the present study an energy-efficient, adaptive mutual authentication protocol is proposed for WMSN, using cryptographic digital signatures to verify sensor nodes' legitimacy in a distributed manner. Each sensor node is initialized with a predefined base station's public key and an internal classifier to differentiate sensor traffic. Each node then requests a digital signature from the base station, which is used for mutual authentication and verifying node security during exchange. In mutual security authentication, the digital signature generated afterward, utilized by nodes, is customized for high-assurance secure communication for military application requirements. The security manager aims to reduce packet overhead. This protocol encounters security requirements with minimal computational and communication overhead, and its evaluation demonstrates enhanced adaptability in WMSNs, effectively protecting against various security threats.

Link: https://doi.org/10.1088/2631-8695/ae4290

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A novel triple-band MIMO antenna for multi-frequency wireless applications

AUTHOR :

Dabhade, M.K.; Warhade, K.K.; Gold Beulah Patturose, G.B.P.; R.K.

JOURNAL NAME:

Engineering Research Express (Vol.-8, Issue-3)

DETAILS:

Published on February 2026

ABSTRACT:

This paper presents the design and experimental validation of a compact triple-band two-port MIMO antenna based on a star-shaped slot-loaded circular radiator for multi-frequency wireless applications. The proposed antenna operates over three distinct frequency bands of 3.1–4.2 GHz, 6.3–8.4 GHz, and 10.1–12.3 GHz, with overall dimensions of 87.5 mm × 35 mm × 1.6 mm (approximately 1.0λ × 0.4λ × 0.0187λ at 3.5 GHz). A key feature of the design is the use of a segmented ground-plane architecture, which effectively confines surface currents and suppresses mutual coupling, enabling high isolation despite a compact edge-to-edge radiator spacing of only 17 mm (≈0.2λ at 3.5 GHz). As a result, the antenna achieves isolation better than 20 dB in the first band, above 18 dB in the second band, and greater than 11 dB in the third band without employing bulky or complex decoupling structures. Circular polarization is realized in the upper band (10.1–12.3 GHz) through controlled perturbation of higher-order modes using symmetrically placed star-shaped slots, with the axial ratio maintained below 3 dB. The antenna provides a peak gain of up to 8 dBi, with gains ranging from 2 to 8 dBi across the operating spectrum. A fabricated prototype was measured, and the results show good agreement with simulations. The MIMO performance metrics demonstrate excellent diversity characteristics, with ECC < 0.01, DG ≈ 9.9–10 dB, CCL < 0.4 bits/s/Hz, and TARC < −10 dB across the operating bands, confirming the antenna's suitability for compact triple-band MIMO systems supporting sub-6 GHz 5G, emerging upper-midband, and X-band wireless applications.

Link: https://doi.org/10.1088/2631-8695/ae39a8

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Deep spatiotemporal signal learning with transformers for multi-day wildfire forecasting

AUTHOR :

Dubey, P.; Londhe, G.V.; Keswani, V.; Chanchlani, A.; Murtuza; Dubey, P.

JOURNAL NAME:

Bulletin of Electrical Engineering and Informatics (vol.-15, Issue-1)

DETAILS:

Published on 1 February 2026

ABSTRACT:

Wildfire forecasting is a critical challenge in environmental signal processing and disaster response planning. The ability to interpret multimodal spatiotemporal signals is essential for early warning systems and resource deployment. This study addresses these limitations by proposing a unified prediction-to-action framework. We utilized four open-access datasets—wildland fire emissions database (WFED), fire information for resource management system (FIRMS), Sentinel Hub, and a custom moderate resolution imaging spectroradiometer+shuttle radar topography mission (ERA5+MODIS+SRTM) fusion—covering fire occurrences, vegetation indices, meteorological parameters, and topographic features. These heterogeneous signals were preprocessed, aligned, and transformed into structured tensors for model training and evaluation. We use a transformer-based system to understand long-term patterns in space and time, enhanced by a belief–desire–intention (BDI) reasoning module that connects our predictions to flexible wildfire response plans. The novelty lies in the integration of signal-aware attention mechanisms with symbolic decision modeling. Model performance was evaluated using F1-score, intersection over union (IoU), mean absolute error (MAE), and directional accuracy. The suggested framework did better than the basic convolutional neural network (CNN) models, reaching an F1-score of 0.74, a directional accuracy of 84.3%, and lowering the MAE to 7.6 km², while also providing clear and relevant action suggestions.

Link: https://doi.org/10.11591/eei.v15i1.10936

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Transfer learning for face recognition using fingerprint biometrics

AUTHOR :

Kute, R.; Vyas, V.; Anuse, A.

JOURNAL NAME:

Journal of King Saud University - Engineering Sciences (vol.-38, Issue-2)

DETAILS:

Published on 13 February 2026

ABSTRACT:

Biometrics is a set of highly automated methods used for recognition purposes including analyzing physical traits of people and statistically measuring them. In forensic applications, fingerprint and face images are mostly used for recognition. There is a need during a criminal investigation to find out a face image of a person from its fingerprint. The proposed method able to identify the face of a person using an associated fingerprint. In this paper, Bregman divergence regularization is used to learn and optimize transferring subspace. This method first gleans knowledge from samples that are meant for training and transfer it to the testing samples. This regularization helps to minimize the probability distribution differences between two different domains. It helps to find a common subspace that boosts the performance of independent and identically distributed (i.i.d.) condition of samples. Practically the samples violate this i.i.d. condition. However, it will help to identify the correct suspect. Biometrics is a set of highly automated methods used for recognition purposes including analyzing physical traits of people and statistically measuring them. In forensic applications, fingerprint and face images are mostly used for recognition. There is a need during a criminal investigation to find out a face image of a person from its fingerprint. The proposed method able to identify the face of a person using an associated fingerprint. In this paper, Bregman divergence regularization is used to learn and optimize transferring subspace. This method first gleans knowledge from samples that are meant for training and transfer it to the testing samples. This regularization helps to minimize the probability distribution differences between two different domains. It helps to find a common subspace that boosts the performance of independent and identically distributed (i.i.d.) condition of samples. Practically the samples violate this i.i.d. condition. However, it will help to identify the correct suspect.

Link: https://doi.org/10.1007/s44444-025-00095-7

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Reaction Kinetics for Dehydrogenation of Decahydroquinoline to Quinoline for Hydrogen Generation

AUTHOR :

Bagwan, F.M.; Dadkar, S.S.; Kinage, A.K.; Vasireddy, S.N.

JOURNAL NAME:

Chemical Engineering and Technology (Vol.-49, Issue-2)

DETAILS:

Published on 12 February 2026

ABSTRACT:

Catalytic dehydrogenation of decahydroquinoline (DHQ) to quinoline is a promising pathway for hydrogen release in liquid organic hydrogen carrier systems. In this work, solvent-free DHQ dehydrogenation over Pd/Al2O3 is systematically investigated to evaluate hydrogen release performance and reaction kinetics. High DHQ conversion (83.9%) and degree of dehydrogenation (82.7%) are achieved at optimal reaction conditions. A power-law kinetic model based on a simplified reaction mechanism is developed and simulated using a Markov Chain Monte Carlo (MCMC) approach for estimation of rate constants and validation of concentration profiles with experimental data. The apparent activation energies are determined to be 45.85 kJ/mol for DHQ to 5,6,7,8-tetrahydroquinoline (bz-THQ) and 185.43 kJ/mol for bz-THQ to quinoline formation, identifying latter as the rate-limiting step. This framework provides mechanistic insight and supports the potential of DHQ as an efficient hydrogen carrier.

Link: https://doi.org/10.1002/ceat.70177

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Tin oxide-based ammonia gas sensors: Status, criticism and strategies

AUTHOR :

Patel, T.; Chothe, U.; Chavali, M.

JOURNAL NAME:

Sensors and Actuators A: Physical (Vol.-398)

DETAILS:

Published on 1 February 2026

ABSTRACT:

Ammonia (NH3) has become a major global pollutant due to its extensive use in agricultural fertilizers, industrial processes, automobile emissions, and natural events such as wildfires. As a highly toxic and corrosive gas, NH3 poses serious hazards to the eyes, skin, and respiratory system, making its precise detection essential for environmental monitoring, industrial safety, and medical diagnostics. Detecting NH3 remains challenging because its atmospheric levels often exist in the sub-ppm range, requiring sensors with exceptional sensitivity, selectivity, and reliability. Tin oxide (SnXOY) has become a prominent NH3-sensing metal oxide due to its high chemical stability, strong sensitivity, and adjustable electronic features that lead to measurable resistance shifts during ammonia exposure. Recent developments demonstrate that nano-structuring SnXOY into forms such as nanowires, nanorods, hollow spheres, and porous frameworks significantly increases active surface area and enhances gas diffusion pathways, resulting in improved sensing performance. Elemental doping further boosts sensor efficiency by modulating the electrical properties of SnXOY and introducing defect sites that promote stronger adsorption of NH3 molecules. Moreover, integrating SnXOY with two-dimensional materials, including graphene and MXenes, enhances conductivity and enables reliable room-temperature sensor operation. Combining SnXOY with conducting polymers like PANI strengthens room-temperature responsiveness by facilitating strong charge-transfer coupling. This review systematically summarizes these modification strategies, recent advancements in SnXOY -based NH3 sensors, and the key challenges regarding selectivity, humidity stability, and power consumption. Future research directions essential for developing robust, low-power, and highly selective NH3 sensing technologies are also highlighted.

Link: https://doi.org/10.1016/j.sna.2025.117352

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Developing a Comprehensive and Spatially Explicit GIS–Fuzzy TOPSIS Framework for Drought Vulnerability Assessment

AUTHOR :

Kumar, V.; Mohite, A.N.; Alsulamy, S.

JOURNAL NAME:

Water Resources Management (vol.-40, Issue-3)

DETAILS:

Published on 4 February 2026

ABSTRACT:

Drought remains a critical challenge to water security, agricultural productivity, and socio-economic stability, particularly under intensifying climate variability. This study presents a novel integration of Geographic Information Systems (GIS) and the Fuzzy Technique for Order of Preference by Similarity to Ideal Solution (Fuzzy TOPSIS) within a Multi-Criteria Decision-Making (MCDM) framework for spatial drought vulnerability assessment. The approach incorporates nine environmental and socio-economic indicators rainfall, soil moisture, groundwater level, temperature, land use/land cover, slope, elevation, roughness, and surface pressure across meteorological, hydrological, agricultural, and socio-economic dimensions. Fuzzy logic was employed to address uncertainty and subjectivity in expert judgment, while GIS facilitated spatial standardization, weighting, and overlay analysis. The integrated model generated a composite vulnerability index and high-resolution drought vulnerability maps, classifying regions into five risk categories. Results show that High and Very High vulnerability zones together account for 47.52% of the study area, driven primarily by low rainfall, depleted groundwater, and persistent soil moisture deficits. The proposed framework enhances the precision of vulnerability mapping, supports targeted resource allocation, and directly aligns with Sustainable Development Goals (SDG 6, SDG 11, SDG 13, and SDG 15). By coupling expert-informed fuzzy MCDM with spatial analytics, this methodology advances climate-resilient planning and sustainable water and land management strategies and is transferable to other drought-prone regions worldwide.

Link: https://doi.org/10.1007/s11269-025-04488-w

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

A systematic review on human action detection and classification architectures using deep learning methodology

AUTHOR :

Parale, M.; Patil, C.H.; Mali, S.M.

JOURNAL NAME:

Multimedia Tools and Applications (Vol.-85, Issue-2)

DETAILS:

Published on 1 February 2026

ABSTRACT:

Video data analysis identifies which, when, where, and by whom an activity is performed and extracts valuable information, insights, and knowledge. Videos, in contrast to photos, are inefficiently handled by a fixed-sized design architecture because their temporal duration varies greatly. Over the last three decades (1994–2024), various approaches based on feature representation, like traditional techniques and deep machine learning functionalities, have been developed to construct a reliable and precise framework and architecture for action recognition, particularly human action recognition for computer vision applications. Deep learning architectures have been developed to analyze and comprehend actions in video data. The field of human action recognition has shown tremendous development with the use of deep learning architectures, with a significant emphasis on enhancing accuracy, efficiency, and real-time capabilities. This systematic review comprehensively analyzes the evolution of deep learning architectures for human action recognition, evaluating their relative strengths across multiple dimensions including accuracy, computational efficiency, temporal modeling capability, and generalization. The review identifies key challenges when working with these architectures for video analysis and human action recognition, while providing evidence-based recommendations for selecting appropriate models based on specific application requirements. This paper will guide researchers in navigating the architectural landscape for human action detection and recognition from videos, offering insights into which approaches are best suited for particular contexts.

Link: https://doi.org/10.1007/s11042-026-21330-6

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Quantitative Evaluation of Value Engineering Metrics for Productivity Improvement Through Function and Cost Analysis in Small-Scale Cooling Units

AUTHOR :

Mohite, S.; Patane, P.; Pawar, A.

JOURNAL NAME:

Journal of Food Process Engineering (vol.-49, Issue-2)

DETAILS:

Published on 27 January 2026

ABSTRACT:

The fundamentals of value engineering are presented in this article and can be applied to any small-scale refrigeration water cooler manufacturing industry. Value engineering is a clever technical engineering approach that is also a cost-effective way to get the required product function at the lowest possible cost. A case study of a refrigeration water cooling system is conducted, where the value engineering method is used to modify the component design and material. According to the case study, the usage of different hardware components, expensive materials, excessive material size, etc., raises the cost needlessly. The compressor, condenser, condenser fan, evaporator, refrigeration control system, outer body, taps, drain tray, and other components of the water cooler have been chosen, and value engineering is applied to these components to cut costs. The functional coefficient, cost coefficient, and value coefficient are calculated to analyze the correlation between various functions and their associated cost. Through the use of value engineering techniques in refrigeration water cooling systems, cost savings are accomplished.

Link: https://doi.org/10.1111/jfpe.70357

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Anti-osteoarthritic effects of stem bark extract of Anogeissus latifolia: a comprehensive in-vivo study

AUTHOR :

Sirsath Patil, C.B.; Shinde, S.R.; Deka, R.S.; Baheti, A.M.; Nagar, S.; Bhatt, S.; Pawar, A.T.

JOURNAL NAME:

Inflammopharmacology (vol.-34,Issue-2)

DETAILS:

Published on 24 January 2026

ABSTRACT:

Background Anogeissus latifolia Roxb. (Family: Combretaceae) is an Indian medicinal plant. The bark of the plant is used traditionally in the Ayurvedic system of medicine for the treatment of pain, inflammation, and arthritis. The objective of this study was to investigate the protective effects of ethanol extract of the stem bark of Anogeissus latifolia Roxb. (EAL) in osteoarthritis-induced rats, to verify its use in traditional medicine and contribute to the understanding of its ethnopharmacological importance. Methods Osteoarthritis was induced by injecting 3 mg of monosodium iodoacetate (MIA) into the knee joint under anesthesia. The anti-osteoarthritic activity of EAL was investigated at 100, 200 and 400 mg/kg oral doses for 28 days by estimating joint swelling, the weight-bearing capacity of joints, locomotor activity, and serum levels of inflammatory markers such as IL-6, IL-1β, TNF-α, MMP-1 and MMP-13. Histopathology and radiological examinations of the knee joints were performed. Results Treatment with EAL resulted in a marginal, statistically nonsignificant reduction in arthritis-induced joint swelling. The weight-bearing capacity of joints and locomotor activity were improved significantly by the EAL. There was a significant decrease in serum IL-6, IL-1β, TNF-α, MMP-1 and MMP-13 levels in EAL-treated rats. Arthritis-induced pathological changes in the knee joints were reversed by the EAL. Conclusions The ethanolic stem bark extract of Anogeissus latifolia exhibited anti-osteoarthritic activity in the MIA-induced rat model, potentially mediated through modulation of inflammatory mediators and cytokines.

Link: https://doi.org/10.1007/s10787-026-02112-w

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Comparative Evaluation of Inception V3 and ResNet 50 for Pneumonia Prediction

AUTHOR :

Bokhare, A.; Metkewar, P.S.; Ruhela, S.; Avasthi, M.; Rather, A.A.; Shaikh, M.S.; Bashir, R.; Dar, S.A.

JOURNAL NAME:

International Journal of Statistics in Medical Research (Vol.-15)

DETAILS:

Published on 13 February 2026

ABSTRACT:

Pneumonia is a fatal respiratory infection that has become the leading cause of death among many people across the world. Its widespread has grabbed great attention making it a major topic for research under various domains. Its severity has led to the development of systems that can predict whether a patient has chances of being diagnosed with pneumonia or not, this is also called as computer aided diagnosis. However, current study intends to identify an Artificial Neural Network (ANN) model that has been able to provide the highest accuracy when it comes to predicting this life-threatening condition. The prediction was initially done with Machine learning techniques but with the introduction of ANN, it was observed that there are models that provided higher accuracy than the ML models. This study investigates how the concept of deep learning which is a vital part of ANN makes use of one of its most efficient models including Inception V3 and ResNet 50 for the prediction of pneumonia and compare their performance to suggest a better solution to the problem. Results indicate that ResNet50 offers clinically meaningful improvements in sensitivity and specificity, supporting its role as a decision-support tool for early pneumonia detection.

Link:
https://www.lifescienceglobal.com/pms/index.php/ijsmr/article/view/10856

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Designed for Control A Critique of Maharashtra's Special Public Security Act, 2024

AUTHOR :

Aamir Ali, S.M.A.; Ghose, A.; Naikade, K.

JOURNAL NAME:

Economic and Political Weekly (Vol.-61, Issue-4)

DETAILS:

Published on 24 January 2026

ABSTRACT:

The Maharashtra Special Public Security Act, 2024 was introduced by the Maharashtra government, eliciting backlash from legal, civil society, and political sectors. Executive assent to the bill will codify extensive powers to criminalise associations, evict communities, confiscate property, and declare organisations unlawful under the guise of public safety.

https://www.scopus.com/pages/publications/105030703992?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

First description of the male Megalogomphus flavicolor (Fraser, 1923) from the fringe of Raimona National Park, Assam, India (Odonata: Gomphidae)

AUTHOR :

Payra, A.; Philip, J.G.; Islam, N.; Mardi, S.; Barman, R.; Deka, S.; Koparde, P.

JOURNAL NAME:

Zootaxa (Vol.-5749, Issue-1)

DETAILS:

Published on 13 January 2026

ABSTRACT:

Megalogomphus flavicolor (Fraser, 1923) was described based on a female specimen from Bihar. To date, no formal description has been available for the male. The present communication deals with the first description of the previously unknown male of M. flavicolor, along with the supplementary notes on the morphology of female, based on a male and a female specimen collected from the fringe area of Raimona National Park in Assam, Northeast India. The present record also designates the first record of M. flavicolor for the northeast Indian state Assam, representing easternmost distributional range of the species.

Link: https://doi.org/10.11646/zootaxa.5748.2.9

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

GTSRB Shield: A Novel Machine Learning Approach to Anomaly Detection in German Traffic Signs Recognition Benchmark (GTSRB) Dataset

AUTHOR :

Patil, K.; Akbar Badusha, A.; Jadhav, S.; Gunale, K.

JOURNAL NAME:

SAE Technical Papers

DETAILS:

Published on 16 January 2026

ABSTRACT:

div class="section abstract"> The escalating dependence of Autonomous Vehicles on Intelligent Transportation Systems (ITS) has highlighted the imperative for comprehensive security protocols to safeguard such vehicles against cyber threats. Intrusion Detection Systems (IDS's) are pivotal in ensuring the protection of these systems by detecting and alleviating unauthorized access and nefarious activities. The German Traffic Sign Recognition Benchmark (GTSRB) database, which encompasses an extensive compilation of traffic sign imagery, functions as a vital asset for the advancement of machine learning-based IDS. This research elucidates an intrusion detection system (IDS) that employs machine learning algorithms to scrutinize the GTSRB database. The proposed IDS emphasize the preprocessing of the GTSRB dataset to extricate pertinent features that can be employed for the training of machine learning models. Research also focuses on model development with machine learning algorithms to classify traffic signs and discern anomalies suggestive of potential intrusions. The efficacy of the models is evaluated utilizing accuracy thereby ensuring that the IDS can consistently differentiate between benign and malicious activities. This inquiry contributes to the domain of intelligent transportation systems by establishing a resilient framework in autonomous vehicles for intrusion detection, thus bolstering the security of automated traffic management systems against prospective cyber threats. The results underscore the criticality of incorporating machine learning methodologies in real-time systems to proactively mitigate security vulnerabilities and preserve the integrity of traffic data. </div

Link: https://doi.org/10.4271/2026-26-0611

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Investigation on plasma electrolytic oxidation duty cycle on Ti6Al7Nb titanium alloy performance for biomedical application

AUTHOR :

Pesode, P.; Wankhede, S.; Mugale, M.; Patil, R.; Hirulkar, N.

JOURNAL NAME:

EPJ Web of Conferences (Vol.-345)

DETAILS:

Published on 7 January 2026

ABSTRACT:

In the current investigation, surface modification of Ti6Al7Nb is done with the help of the plasma electrolytic oxidation process to understand the effect of duty cycle on its performance. Ti6Al7Nb is a better alternative as compared to Ti6Al4V and Ti6Al4V ELI titanium alloys for biomedical applications because vanadium is replaced with niobium, which does not have adverse effects on cells like vanadium does. This study investigates the influence of plasma electrolytic oxidation (PEO) duty cycle on the coating properties of Ti6Al7Nb titanium alloy, focusing on thickness, hardness, surface roughness, pore size, and corrosion resistance. Na_2SiO_3, $Na_3PO_4 \cdot 12H_2O$, and KOH was used as electrolyte for coating Ti-6Al-7Nb titanium alloy, PEO coating is done at constant voltage of 500 V. Five different duty cycle 20%, 30%, 40%, 50% and 60% are used to understand the effect of it on the performance of Ti-6Al-7Nb titanium alloy. For characterisation of coating SEM, EDS, XRD techniques are used. From current study it was noticed that coating thickness increases from 10.19 mm to 18.73mm as duty cycle increases from 20% to 60%, however hardness increases from 718.80 HV to 883.35 HV as duty cycle increases from 20% to 60%. It was observed that high duty cycle increases coating hardness and thickness due to intense discharge events. From EIS testing it was notice that coating is made-up of two-layer structure. Uniform distribution of electrolyte compositions was observed in PEO coated Ti-6Al-7Nb titanium alloy.

Link: https://doi.org/10.1051/epjconf/202634501006

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Polar features analysis of electromagnetic field signatures for non-intrusive transmission line fault diagnosis

AUTHOR :

Nehete, A.L.; Bankar, D.S.; Dond, S.K.; Khadse, C.B.

JOURNAL NAME:

Journal of Integrated Science and Technology (Vol.-14, Issue-2)

DETAILS:

Published on 29 January 2026

ABSTRACT:

Conventional power system protection schemes rely on contact-based voltage and current measurements, which are often constrained by current transformer saturation, insulation requirements, and installation complexity. This paper presents a non-intrusive fault diagnostic framework based on electromagnetic field signatures derived from transmission line currents. A current-to-magnetic-field transformation is used to obtain non-contact magnetic field components, which are represented in the polar domain using radial magnitude (ρ) and angular orientation (θ). The polar representation enables intuitive visualization of fault-induced electromagnetic disturbances and supports systematic feature extraction. The electromagnetic validation of cross-platform is accomplished by matching the results of analytical MATLAB/Simulink analysis to finite element analysis in COMSOL Multiphysics, showing consistency in the magnitude and spatial behavior of the magnetic field. Various such fault studies are carried out at different points along the transmission line. Statistical analysis indicates that radial component features obtained as features of the radial component, distinguish well between faults and attenuate predictably with fault distance, making them distance-sensitive diagnostics. Angular features on the contrary are not quantitatively sensitive enough and are thus used in qualitative interpretation. The findings validate the hypothesis that polar-domain magnetic field sensors based on non-contact sensing are a physically realistic, dependable, and scalable method of diagnosing transmission line faults and that the family has a significant prospect of intelligent protection in the future.

Link: https://doi.org/10.62110/sciencein.jist.2026.v14.1529

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Cloud Forensics: A Critical Review of Techniques, Standards, and Research Opportunities

AUTHOR :

Tandale, A.; Kulkarni, A.; Sebait, S.; Patel, V.; Wategaonkar, D.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1692 LNNS)

DETAILS:

Published on 22 January 2026

ABSTRACT:

Cloud forensics represents a developing discipline that tackles the complexities associated with investigating digital offenses within cloud settings. This research offers an extensive examination of cloud forensic methodologies, emphasizing the numerous challenges introduced by cloud infrastructure, including data acquisition, integrity, and privacy concerns. The document analyzes current frameworks, contrasts various methodologies, and suggests improvements for enhancing the efficacy of cloud forensic investigations. Significant findings indicate that, de-spite the availability of multiple solutions, challenges such as multi-tenancy, distributed storage, and jurisdictional issues persistently hinder effective forensic analysis.

Link: https://link.springer.com/chapter/10.1007/978-981-95-3701-3_35

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

FarmKnow: Building an Agriculture Knowledge Base

AUTHOR :

Kale, P.; Awankar, R.; Dere, A.; Gavas, S.; Teke, A.; Khan, A.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1766 LNNS)

DETAILS:

Published on 8 November 20 January 2026

ABSTRACT:

The aim of the study “Farm Know” is to create an extensive agriculture corpus to aid research and development in a certain area. The procedure involves scraping 187000 files using different Python libraries and consolidating them into a single parquet file to enhance storage and analysis. Some of the pest management, crop diseases, weather conditions, and farming practices insights that are derived from corpus under analysis are quite noteworthy. The study is essential because it may shift the paradigm on agricultural research owing to the fact that there will be massive data that can undergo rigorous analysis and experimentation. The target users of “Farm Know” are researchers, agronomists, and policymakers which enables greater ease of addressing emerging trends, identifying problems, and devising innovative solutions due to diverse agriculturally related data being consolidated into one platform. This corpus also stands to advance technology in agriculture by enabling machine learning and AI applications. The goal of this research is to foster innovation and new ideas within the agricultural community by stimulating the newfound accessibility provided by integrating all corpuses with agricultural data.

Link: https://doi.org/10.1007/978-3-032-13806-4_10

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Ankur-Nurturing the Seedling: The Growth of Art Therapy in India

AUTHOR :

S.; S.; A.; M.

JOURNAL NAME:

The Wiley Handbook of Art Therapy

DETAILS:

Published on 31 October 2025

ABSTRACT:

Art therapy as a formal mental health profession is gaining recognition worldwide. This trend increases opportunities for exchanging psychological and philosophical theories between the East and the West. In India, the arts have been used in contemplative and traditional practices for centuries to comprehend the connection between the mind and body. This chapter discusses the growth of art therapy and development of formal training in India. The growth of art therapy in India is a direct response to ideas around health and well-being and the need for mental health professionals trained in evidence-based approaches rooted in culturally sensitive and traditional practices. Cultural factors influence the understanding, presentation, diagnosis, management, course, and outcomes of mental illnesses, thus creating the need for ethical and culturally oriented training. The emergence and development of the idea of seedling, or "Ankur", is comparable to the growth of art therapy in various ways.

Link: https://doi.org/10.1002/9781394215027.ch86c

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Are Sustainable Consumers Socially Responsible Investors? An Empirical Examination Using PLS-SEM

AUTHOR :

Gaikwad, S.B.; Verma, S.; A.

JOURNAL NAME:

Lecture Notes in Networks and Systems (1806 LNNS)

DETAILS:

Published on 13 February 2026

ABSTRACT:

In an era where climate collapse is a serious concern, it is not only prudent to align our purchasing decisions with our investment decisions, but it is also the foundation of living sustainably and hence this study investigates the relationship between sustainable consumption behaviour (SCB), socially responsible investing (SRI), and attitude. It also aims to examine the moderating effect of perceived risk. A purposive sample of 256 respondents was used to gather the data. Variance-based partial least squares structural equation modelling (PLS-SEM) was used to test the hypotheses and validate the proposed model. The findings show that SCB has a considerable impact on both attitude towards SRI and SRI, and that attitude towards SRI has a positive effect on SRI. Results showed an insignificant moderating effect of perceived risk on the relationship between SCB and SRI. The results highlight the importance of internal beliefs and values in determining sustainable consumer behaviour. Further, the insignificant moderating effect of risk on the SCB–SRI relationship indicates strong value-driven behavior.

Link: https://doi.org/10.1007/978-3-032-16389-9_1

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Reinforcing polymer nanocomposites: the transformative role of Eri silk fibroin (Philosamia ricini) in mechanical performance

AUTHOR :

Asthana, N.; Pal, K.; Chopra, L.; Kuiri, B.; Srivastava, A.; S.; Abdullah, M.M.; Albargi, H.B.

JOURNAL NAME:

European Physical Journal: Special Topics

DETAILS:

Published on 18 February 2026

ABSTRACT:

The current investigation evaluates the impact of Eri-silk fibroin (SF) on the mechanical properties of polymer nanocomposites and explores their potential applications. Eri SF, a natural biopolymer, is incorporated into various polymer matrices to enhance their mechanical characteristics. Eri silk fibroin (Philosamia ricini), renowned for its unique semi-crystalline structure and superior biocompatibility, was integrated into polymer nanocomposites to investigate its influence on mechanical performance. The incorporation of optimized fibroin nanofillers led to notable improvements in tensile strength, elasticity, and impact resistance of the polymer matrix. Microstructural analysis revealed enhanced interfacial bonding between fibroin and the polymer phase, resulting in superior load transfer and structural integrity. Comparative evaluation demonstrated a significant increase in mechanical modulus with minimal compromise in flexibility. The study concludes that Eri silk fibroin serves as a sustainable and high-performance reinforcement agent in polymer nanocomposite design, opening new possibilities for advanced biopolymer engineering and eco-friendly material applications. By examining key properties, such as tensile strength, flexibility, and durability, we assess how the addition of Eri silk fibroin influences the performance of these nanocomposites. The structural, optical, and mechanical properties of silk fibers have been analyzed using several techniques, including scanning electron microscopy (SEM) with energy-dispersive spectroscopy (EDS), and tensile testing. In addition, numerical studies on stress–strain response and potential energy evolution reveal a linear increase in stress from ~ 0.7 to 8 MPa with strain up to 6%, accompanied by a quadratic rise in stored elastic energy reaching ~ 35 nJ. The research highlights significant improvements in mechanical strength and flexibility, making the enhanced nanocomposites suitable for a range of applications, including wound dressings, water filtration, air filtration, protective clothing, and packaging materials.

Link: https://doi.org/10.1140/epjs/s11734-026-02172-7

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Impact of responsible leadership on employee innovation and turnover intention: a multigroup analysis

AUTHOR :

Pathak, P.; Jha, S.; Haque, A.

JOURNAL NAME:

Asia-Pacific Journal of Business Administration

DETAILS:

Published on 12 February 2026

ABSTRACT:

Purpose: This study grounded in social learning theory examines the impact of instrumental and integrative responsible leadership behavioral styles (RLBS) on employees' innovative work behavior (IWB) and turnover intention. Organisational citizenship behavior (OCB) and meaningful work (MFW) are mediators between RLBS and outcome variables.

Design/methodology/approach:Data from 602 manufacturing and service sector employees in India were analyzed using structural equation modeling and mediation analysis with AMOS software. A multigroup invariance analysis compared the application of RLBS across the two sectors.

Findings: RLBS significantly enhances IWB and reduces turnover intention. OCB and MFW fully mediate the RLBS-IWB relationship, but their impact on turnover intention remains partial. The multigroup analysis confirms that RLBS operates consistently across sectors, reinforcing its universal applicability.

Practical implications: Organisations aiming to enhance innovation and reduce turnover should invest in developing responsible leadership practices that balance instrumental and integrative styles. By fostering a leadership culture that promotes quick decision-making, employee engagement and MFW, companies can strengthen employee motivation, increase OCB and enhance overall retention and innovation outcomes.

Originality/value: This study introduces a novel RLBS model integrating instrumental and integrative leadership styles, offering empirical validation within a South Asian context. The findings provide actionable insights for fostering innovation and employee retention through RLBS.

Link: https://doi.org/10.1108/APJBA-05-2025-0354

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Organic and Inorganic Nanofillers: Properties and Applications

AUTHOR :

Kale, S.; Kuchekar, A.; Autade, K.; Sumbe, R.; Desai, U.; Gawade, A.

JOURNAL NAME:

Polymer Nanocomposites: Advances in Design, Synthesis, and Applications

DETAILS:

Published on 29 January 2026

ABSTRACT:

The potential of both organic and inorganic nanofillers to improve the characteristics of composites in a range of industrial applications is drawing a lot of interest. Because of their special qualities, such as flexibility, low weight, and functionalization capabilities, organic nanofillers such as carbon nanotubes, graphene oxide, and organic polymers are perfect for use in sensors, electronics, and medicine. The strength, thermal stability, and conductivity of inorganic nanofillers, such as silica, metal nanoparticles, and clay minerals, on the other hand, make them appropriate for use in environmental, automotive, and construction engineering. The features, synthesis processes, and functionalization strategies of both organic and inorganic nanofillers are examined in this chapter, with an emphasis on how they can enhance the mechanical, thermal, and electrical characteristics of nanocomposites. Additionally, the study examines the several applications of nanofillers, which improve the functionality and effectiveness of products in a variety of industries, such as energy storage, biology, and materials research. This will emphasize how crucial these nanofillers are becoming to next-generation technologies

Link: https://doi.org/10.1007/978-3-032-00365-2_3

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Securing IoT Environments: Deep Learning-Based Intrusion Detection

AUTHOR :

Sharma, A.K.; Purohit, N.; Joshi, S.; Lakkewar, I.U.; Khobragade, P.

JOURNAL NAME:

Deep Learning for Intrusion Detection: Techniques and Applications

DETAILS:

Published on 14 November 2025

ABSTRACT:

The Internet of Things (IoT) has become a cornerstone of modern technology, facilitating seamless interaction between devices and networks. However, because these devices are frequently open to various cyberattacks, the widespread use of IoT has brought forth serious security challenges. More sophisticated solutions are required since traditional security techniques cannot handle the complexity and size of IoT environments. Deep learning (DL) has emerged as a powerful solution for addressing these challenges because of its ability to analyze vast amounts of complex, high-dimensional data and adapt to evolving threat landscapes. In this regard, this chapter discusses the crucial sectors of cybersecurity related to securing IoT environments and security challenges to IoT including various devices, constrained devices, and data privacy concerns. It then discusses the applicability of deep learning-based intrusion detection systems (IDSs) to enhance the security of IoT environments.It begins with a background and purpose, and highlights the importance of cybersecurity and the various challenges in IoT environments. The categories, definitions, and fundamental concepts of deep learning and their applicability to intrusion detection are all covered in detail in sections that also provide a complete examination of important elements such as data collection, feature extraction, anomaly detection, and model training. The study highlights the critical aspects of deep learning-based IDS that ensure data safety and privacy. The discussion extends to IoT operations with security optimization, highlighting the balance between performance and protection. Finally, the chapter outlines challenges and future directions, including the need for scalable models, adversarial robustness, and integration with emerging technologies like edge computing and blockchain, paving the way for a secure IoT ecosystem.

Link: https://doi.org/10.1002/9781394285198.ch12

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Enhancing Security in Smart Environments Using Deep Learning: A Comprehensive Approach

AUTHOR :

Yaqoob, S.I.; Kamal, P.; Aggarwal, S.; Kanade, A.; Kanade, S.

JOURNAL NAME:

Deep Learning for Intrusion Detection: Techniques and Applications

DETAILS:

Published on 14 November 2025

ABSTRACT:

Smart environments are networks of systems and devices that offer ease on a previously unseen level but, of course, also threaten new openings in security lapses. This chapter discusses the exploitation of deep learning techniques in strengthening security protocols in smart environments. The chapter begins with a brief overview of smart environments and the issues of security they bring into the picture and then deep-dives into how well deep learning can solve those issues. This chapter lays down and describes several deep learning models—such as GANs, RNNs, and CNNs among others—and how they could be used for enhancing security protocols. It uses case studies and real data to illustrate the strength of deep learning algorithms for prediction of threats, detection of anomalies, and intrusion detection. This chapter reviews possible usage of deep learning alongside edge computing and blockchain to form robust security frameworks. It further analyses its function in the framework for proactive defense against novel threats. The chapter goes a step further and explains challenges with considerations for deploying deep learning for security in smart environments with interpretability, scalability, and data privacy issues. It gives ways of dealing with the said challenges and identifies the multidisciplinary involvement of practitioners in machine learning and security experts.

It ends with this chapter as it reminds everyone that deep learning revolutionizes the reinforcement of security protocols in intelligent environments by using advanced algorithms and innovative methods to allow stakeholders better proactive protection for vital infrastructures and thus ensure resilience and integrity of intelligent ecosystems.

Link: https://doi.org/10.1002/9781394285198.ch9

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Secure Vertical Federated Learning: A Review of Privacy and Security Challenges

AUTHOR :

Prabhune, S.; Jagdale, B.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1670 LNNS)

DETAILS:

Published on 8 February 2026

ABSTRACT:

Vertical federated learning (VFL) has become a cutting-edge approach for collaborative machine learning, as it enables multiple organizations to jointly train models on vertically partitioned data where each party holds different features of a common dataset without revealing any of their sensitive data. This is particularly useful for purposes of driving business operations in sectors characterized by strict data confidentiality laws such as banking, health care, and telecommunications. Nevertheless, VFL comes with privacy and security issues that are more complex than one exists in conventional or horizontal federated learning systems. In this paper, we present an extensive review of these challenges, focusing consideration on the significance of communications protocols that serve for safeguarding information and model confidentiality. Different protocols like secure multiparty computation (SMPC), homomorphic encryption (HE), as well as differential privacy (DP), their virtues and demerits, and their influence on the level of security and communication are discussed. Moreover, we explore and examine about how existing advancements of VFL can help to improve the efficiency of model training, thus offering path for secure and scalable solutions to existing challenges. By identifying current gaps and reviewing effective solutions, this paper aims to guide future research in building VFL frameworks that are both secure and efficient.

Link: https://doi.org/10.1007/978-981-95-3486-9_22

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Customer Satisfaction Framework for Telecom Services: Multidimensional Constructs and Demographic Variations

AUTHOR :

Bhale, U.A.; Banerjee, S.; Joshi, P.; Kalshetti, P.; Ray, S.

JOURNAL NAME:

MSW Management (Vol.-36, Issue-1)

DETAILS:

Published on February 2026

ABSTRACT:

In the hyper-competitive post-pandemic Indian telecom landscape, traditional satisfaction models are increasingly inadequate for capturing the complexities of a diverse user base transitioning to 5G. This study proposes a multidimensional framework to investigate the key determinants of customer satisfaction and their demographic contingencies. Using a robust sample of 1,600 subscribers and a dual-stage EFA-CFA methodology, the research identifies five core dimensions: Network Performance, Perceived Value, Customer Support, Service Experience, and Customer Delight. Moving beyond standard linear models, this study employs chi-square analysis to reveal significant demographic asymmetries, proving that gender and age significantly moderate how these constructs drive satisfaction. The findings challenge the "one-size-fits-all" approach and provide a strategic roadmap for operators to personalize service delivery in the 5G era.

Link:
https://mswmanagementj.com/index.php/home/article/view/774

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Enhancing MRI-Based Brain Tumor Diagnosis with IDTNet: A Hybrid CNN Approach

AUTHOR :

Singha, A.; Kauchali, R.; Sayyed, F.

JOURNAL NAME:

Journal of Intelligent and Fuzzy Systems

DETAILS:

Published on 13 February 2026

ABSTRACT:

Early and accurate classification of brain tumors is of utmost significance to diagnosis and treatment planning. In this study, we introduce a deep learning-based approach to classify brain MRI images with Inception DenseNet with Transitions Network (IDTNet), a novel hybrid convolutional neural network that combines the strengths of Inception modules, DenseNet connectivity, and transition layers with skip connections. The model makes use of a dataset that contains 7022 MRI images that were obtained from figshare, the SARTAJ dataset, and Br35H, among other sites, Evaluated IDTNet against three CNN baseline architectures derived from VGG16, DenseNet121, and InceptionV1. Our proposed model has trained from scratch with aggressive data augmentation applied to improve generalization. IDTNet achieves a best accuracy of ~98%, performing better than the baselines and achieving 100% recall on the meningioma class. These findings underscore the effectiveness of hybrid architectures in tackling complex imaging tasks.

Link: https://doi.org/10.1177/18758967251413998

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Preparation, optimization, and characterization of ivermectin microemulsion as a potential glioblastoma treatment

AUTHOR :

Md, S.; Dargude, S.; Patil, A.; Ibrahim, I.M.; Kotta, S.; Jagdale, S.C.

JOURNAL NAME:

Open Chemistry (Vol.-24, Issue-1)

DETAILS:

Published on 11 February 2026

ABSTRACT:

The prognosis for glioblastoma multiforme (GBM), a very aggressive brain tumor, is poor, and there are few available treatments. Various oils, cosurfactants, and surfactants were tested for solubility. A pseudo-ternary phase diagram was made using the water-titration method. Box-behenken design (BBD) was used to optimize the microemulsion, which was prepared in batches by varying the ratio of surfactant to co-surfactant. The optimised batch was evaluated for particle size (PS), polydispersity index (PDI), zeta potential (ZP), %Transmittance, chemical interaction, pH, conductivity, specific gravity, drug content, in-vitro drug release, and in-silico docking. The microemulsion formulation having Transcutol HP, Tween 80, and Capmul MCM C8, showed satisfactory PS (74.9 ± 0.35 nm), PDI (0.223 ± 0.021) and ZP (−0.35 ± 0.15 mV) respectively. The in vitro cell line study in U87 cells of optimized IVM formulation shown better treatment for brain diseases. Additionally, IVM has a good binding affinity towards mTOR kinase for GBM as shown by an in-silico study. In summary, IVM-loaded MEs offer a promising approach for GBM treatment, warranting further pre-clinical evaluation.

Link: https://www.deepdyve.com/lp/de-gruyter/preparation-optimization-and-characterization-of-ivermectin-q4OMJxJ9Im

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Computational Analysis of a C-D Nozzle with Different Diverging Angles

AUTHOR :

Vora, D.A.; Patel, R.; Bajaj, D.K.

JOURNAL NAME:

Lecture Notes in Mechanical Engineering

DETAILS:

Published on 8 February 2026

ABSTRACT:

A CD Nozzle is a type of variable area passage designed to accelerate gases to supersonic speeds. It features a converging section where the minimum area is located at a specific point known as the throat. This study presents a comparative flow analysis conducted at various divergent angles, executed in two distinct phases. The first phase involved the design of the convergent-divergent nozzle and the subsequent computational fluid dynamics (CFD) analysis. The second phase entailed a comparison with another foundational study. For the analysis, a two-dimensional axisymmetric nozzle geometry was created using Ansys DesignModeler, and the CFD analysis was performed with Ansys Fluent. The primary distinction between the two geometries lies in the outlet divergence angle, while all other dimensions, including the sectional area, throat cross-sectional area and nozzle length, were maintained constant. The outlet divergence angles examined were 10°, 15° and 20°. The analysis considered the velocity, pressure and temperature profiles for both configurations. The simulations indicate that a larger outlet divergence angle correlates with a higher speed magnitude. Notably, the nozzle with a 20° divergence angle demonstrates a lower temperature and pressure distribution throughout the expansion zone when compared to the 10° and 15° nozzles, which exhibit elevated temperatures and pressures in the same region. Given that the 20° nozzle achieves a higher exit velocity, it appears to be the most advantageous option based on the current findings.

Link: https://doi.org/10.1007/978-981-95-2239-2_12

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Statistical Modelling of Wastewater Quality Prediction using AI and IOT Sensors

AUTHOR :

Chamkure, C.S.; Nagawade, R.A.; Yadav, S.R.; Kargaonkar, S.N.

JOURNAL NAME:

Journal of Solid Waste Technology and Management (Vol.-52,Issue-1)

DETAILS:

Published on 1 January 2026

ABSTRACT:

Rapid urban expansion continues to intensify pressure on wastewater networks, increasing the need for reliable systems capable of real-time effluent condition forecasting. Traditional laboratory procedures, though accurate, cannot meet the speed, scalability, and operational responsiveness required for modern water governance. This study introduces a streamlined yet robust framework that integrates statistical modelling with intelligent sensing and analytical systems to deliver fast, interpretable, and high-precision assessments of effluent behavior. Continuous measurements of pH, turbidity, dissolved oxygen, conductivity, and biochemical oxygen demand were acquired from distributed smart sensors to capture dynamic variations in effluent characteristics. Statistical methods-including regression analysis, multivariate modelling, and Principal Component Analysis-were used to isolate key predictors, reduce dimensionality, and expose hidden data structures. Statistical Process Control charts enabled immediate recognition of deviations from operational thresholds, ensuring early detection of abnormal conditions. These statistical insights were further strengthened using advanced learning models such as Random Forest, Support Vector Regression, and Long ShortTerm Memory networks, which effectively captured non-linear responses and temporal dependencies. The integrated system demonstrated substantial performance gains, reducing forecasting errors by nearly 30% and consistently achieving high predictive accuracy ($R^2 > 0.90$) even under noisy or partial data streams. Anomaly detection improved by approximately 20%, confirming the system's resilience and suitability for field environments. The core novelty lies in the unified combination of statistical inference, machine-learning-based forecasting, and real-time sensor intelligence within a single operational architecture. This approach enhances proactive effluent management and supports sustainable, regulation-compliant water operations.

Link: https://doi.org/10.5276/jswtm/iswmaw/521/2026.91

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Performance optimization of sustainable mortar with GGBS and ceramic waste using response surface methodology

AUTHOR :

Shinde, S.N.; Sujatha, A.; Sutar, A.S.; Sinha, M.K.; Akhtar, N.; Lingeshwaran, N.

JOURNAL NAME:

Asian Journal of Civil Engineering

DETAILS:

Published on 11 February 2026

ABSTRACT:

This study investigates the potential of Ground Granulated Blast Furnace Slag (GGBS), limestone powder (LSP), and ceramic waste (CW) as sustainable alternatives in mortar production. Six mix proportions were prepared by partially substituting cement and fine aggregates to evaluate dry density, water absorption, and compressive strength (CS). The results showed that the optimum performance was achieved at Bio3 (6% GGBS, 6% limestone, and 30% ceramic waste), where dry density reached 2255.36 kg/m^3, water absorption peaked at 3.47%, and CS improved to 39.82 N/mm^2 compared to the control mix. Beyond this level, strength and density decreased due to excessive replacement, leading to higher porosity. To enhance predictive capability, Response Surface Methodology (RSM) was applied, yielding high accuracy with R^2 values of 0.9439 for density, 0.9439 for water absorption, and 0.9293 for strength. Optimization revealed the optimal mix of 1.01% GGBS and 13.14% ceramic waste, with a desirability index of 1. The integration of experimental and machine learning approaches confirms the feasibility of eco-friendly construction composites.

.Link: https://doi.org/10.1007/s42107-026-01638-2

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Analysis of Trauma-Informed and Trauma-Sensitive Mindfulness-based Yoga Therapies

AUTHOR :

Shetty, L.; G.G.; Chandrababu, R.; Amuthan, A.; S.

.

JOURNAL NAME:

Advances in mind-body medicine (Vol.-40, Issue-1)

DETAILS:

Published on January 2026

ABSTRACT:

Trauma can have a significant and long-lasting impact on people; it frequently shows up as anxiety, sadness, and post-traumatic stress disorder (PTSD). The interaction between the physiological and psychological reactions to trauma emphasizes the significance of holistic healing approaches. Studies suggest that conventional therapeutic approaches might not adequately tackle the intricacies of trauma, which has led to the investigation of body-based therapies like yoga. Trauma-Informed Yoga (TIY) places a strong emphasis on comprehending how trauma affects the body and mind while fostering safety and security that values empowerment, choice, and building trust. Trauma-Sensitive Yoga (TSY) emphasizes physical practices that can be fundamental in healing by encouraging awareness and a connection to the body. This method integrates psychological therapy to assist people in navigating their trauma in a safe environment. Both strategies aim to create a secure and encouraging environment that promotes healing via bodily awareness and mindfulness. In clinical research, the relative effectiveness of different approaches is poorly understood. The present work assesses TIY and TSY therapies based on trials registered on ClinicalTrials.gov. PTSD, anxiety, and depression results were reported in randomized controlled trials (RCTs) that were published in the past ten years. The results show that TIY and TSY have unique benefits. It is challenging to validate the efficacy of these approaches based on current clinical outcomes. The efficacy of these approaches is specific to trauma history and intensity, gender, age, duration, and mode of practice. Further clinical studies focusing on these variables would help better understand the approaches in clinical settings. Keywords: trauma-informed, trauma-sensitive, yoga intervention, yoga clinical trials.

Link:
https://www.scopus.com/pages/publications/105030073941?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

A Review on Sustainable Microalgae-Based Approaches for CO2 Capture, Bioenergy, and Value-Added Products

AUTHOR :

Deshmukh, M.; Kothawade, T.R.; Pathan, A.; Behera, U.S.; Sangwai, J.S.; Byun, H.-S.

JOURNAL NAME:

Korean Journal of Chemical Engineering

DETAILS:

Published on 12 February 2026

ABSTRACT:

The rising level of CO2 concentration in the atmosphere that breached the 421ppm mark is a serious challenge to environmental and economic sustainability. Microalgae have emerged as a sustainable and efficient biological platform for CO2 capture, offering rates 10–50 times higher than terrestrial plants. This work critically analyzes the recent developments concerning microalgae-based technology in CO2 sequestration, generation of bioenergy, and synthesis of high-value products. Particularly, hybrid cultivation systems, nanotechnology-assisted carbon fixation, and artificial intelligent (AI) combined with bioreactor optimization demonstrated productivity up to a 45% increase in carbon intake and up to 60% improvement in lipid productivity. This study systematically assesses the cultivation mode (photoautotrophic, heterotrophic, mixotrophic), CO2 feeding methods, harvesting, drying technology, cost-benefit, and lifecycle analysis. Challenges such as scalability, contamination, energy demands, and commercialization hurdles are discussed. A key novelty of this review is the integration of recent trends in genetic engineering, circular bioeconomy strategies, and interdisciplinary approaches for enhancing process efficiency. In addition, it points out major blind spots in existing systems, including low biomass yields in open ponds and underdeveloped hybrid photobioreactors. This review offers an inclusive plan of industrial implementation, promoting interdisciplinary cooperation between academia and industry, and innovative policy to face the action plan of implementation of microalgae technologies to impact climate change mitigation.

Link: https://doi.org/10.1007/s11814-025-00632-9

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

An Automated Fake News Detection Framework Using Residual Convolutional Bi-LSTM with Improved Optimisation-Based Weighted Feature Representation

AUTHOR :

Rane, R.; Radhakrishnan, R.

JOURNAL NAME:

Journal of Information and Knowledge Management

DETAILS:

Published on February 2026

ABSTRACT:

In the extensive growth of social media platforms, fake news is false information spread among people around the world. Fake news weakens public trust and societal stability; it has negative impacts that necessitate for fake news. In order to enhance the public trust and improve the social media users, fake news detection is crucial, which is a complex and multi-dimensional task due to the diverse characteristics of fake news. More researchers have explored several deep learning and machine learning approaches for fake news detection approaches yet the existing binary classification mechanism is not sufficient for handling imbalanced training data to enhance poor performance in the fake news detection process also it affects the interpretability and consumes high computational duration. With the aim of rectifying these complexities, an automated fake news detection mechanism is proposed in this research work to ultimately recognise unreliable information for improving social media users' effectiveness. Initially, the necessary data are taken from the publicly available datasets, such as the WELFake dataset and Fake News dataset; it is fed into the preprocessing phase. Here, the punctuation, special characters, redundant content and inappropriate data are mitigated, which can generate cleaned data. Then, the preprocessed data is given to the feature extraction process to efficiently extract the relevant informative features for enhancing better detection outcomes. Here, the Bidirectional Encoder Representations from Transformers (BERT) is initially used to retrieve the first set of features, the Recurrent Neural Network (RNN) extracts the temporal features and the Convolution Neural Network (CNN) is used to extract the spatial features. Subsequently, these features are fused in the weighted feature selection process, where the weights are quickly tuned through the Improved Horse Herd Optimisation Algorithm (IHHOA).

Link: https://doi.org/10.1142/S0219649225501357

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

RailVani: GenAI Powered Public Announcement System for Indian Railways

AUTHOR :

Awankar, R.; Bedekar, M.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1795 LNNS)

DETAILS:

Published on 4 February 2026

ABSTRACT:

As one of the world's largest and most multilingual transportation system, Indian Railways depends upon public address systems for the seamless functioning and safety of passengers. The Indian Railways suffers from poor voice quality, lack of personalization, limited contemporaneous adaptability, and insufficient support for multilingual functionalities. This is why we developed RailVani, a Generative AI-based public announcement system for Indian Railways. RailVani operates on a modular pipeline that includes data extraction from railway databases, inconsistency normalization, context enhancement using LLMs, and real-time speech generation with best of class TTS models. Additional features include multilingual outputs and customizable automation templates specific to individual stations. Leveraging the NISQA framework to evaluate speech discernment and intelligibility, a comparative analysis of four TTS models: Zonos, GPT-4o Mini, MMS-TTS, and Kokoro was assessed. The Kokoro and GPT-4o models showed unparalleled resilience in delivering value across varying acoustic conditions for advanced multilingual AI speech while traditional recordings failed obliterated the competition in all other metrics, proving the AI models' spectacular battleground supremacy. The results confirm that RailVani improves the quality of announcements, responsiveness, and overall commuter satisfaction. Further research will include edge computing, TTS models resilient to noise interference, and adaptation to regional languages to broaden the system's capabilities for public communication at Indian railway stations.

Link: https://doi.org/10.1007/978-3-032-15404-0_28

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Exploring the impact of personality traits and cognitive diversity on knowledge-sharing behaviour, team innovation climate, and team agility in Agile Software Development

AUTHOR :

Shameem, M.; Gangwar, H.; Niazi, M.; Mahmood, S.; Mishra, A.

JOURNAL NAME:

Cognition, Technology and Work

DETAILS:

Published on 5 February 2026

ABSTRACT:

Context Knowledge-sharing has been considered one of the most significant factors in the success of Agile Software Development (ASD) projects. Although its importance has been widely acknowledged in literature, prior studies have not sufficiently explored its intermediate relationships with personality traits, team innovation climate, and team agility in enhancing team dynamism within ASD. Objective This study proposes and validates a theoretical model to examine the relationships among personality traits, knowledge-sharing behaviour, team innovation climate, and team agility. Methods Data were collected from 361 agile practitioners through a questionnaire survey. The collected data were analyzed using descriptive statistics, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM). Results The findings indicate that extraversion, agreeableness, and openness to experience positively influence knowledge-sharing behaviour, whereas neuroticism and conscientiousness are negatively related. Furthermore, knowledge-sharing behaviour positively influences team innovation climate and team agility. In addition, a positive relationship is observed between cognitive diversity and knowledge-sharing behaviour among agile practitioners in self-organizing teams. Conclusion This study highlights the essential role of personality traits and cognitive diversity in shaping knowledge-sharing behaviour, which in turn enhances team agility and fosters an innovative climate in agile software projects. The findings provide a valuable knowledge base for industry practitioners and researchers by clarifying how personality traits and cognitive diversity influence team agility and collaboration within agile development teams.

Link: https://doi.org/10.1007/s10111-026-00858-5

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Automating Data Discovery: Bridging EDA and AutoML for Smarter, Faster Insights

AUTHOR :

Annadate, P.; Aher, N.; Joshi, S.; Gupta, R.; Pise, N.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1710 LNNS)

DETAILS:

Published on 3 February 2026

ABSTRACT:

This paper presents DataLens, a comprehensive platform designed to enhance data-driven decision-making through automated preprocessing and insightful data analysis. As the volume and complexity of data increase, traditional Exploratory Data Analysis (EDA) methods: characterized by manual steps, become increasingly inefficient and error-prone. DataLens addresses these challenges with its AutoPreprocessor, achieving a competitive accuracy of 84.5%, a low inference time of 1.8 s, and a minimal memory footprint of 180 MB, positioning it favorably against established frameworks such as Google AutoML and H2O AutoML. By automating the preprocessing and reporting processes, DataLens significantly streamlines EDA, allowing analysts to focus on model building and strategic decision-making. The platform also includes the Bird Eye feature for comprehensive data visualization and the Insights Generator for transforming complex analytical results into actionable insights. Through a comparative analysis of various automated preprocessing frameworks, this study demonstrates DataLens's potential to optimize workflows and enhance productivity across diverse industries. Ultimately, DataLens aims to redefine data exploration and empower users with high-quality outputs.

Link: https://doi.org/10.1007/978-3-032-10664-3_9

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Automatic Speech Recognition System for Ahirani Language Using HMM in Speaker Dependent Environment

AUTHOR :

Patil, S.; Patil, C.H.; Jabde, M.; Mahandule, V.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1710 LNNS)

DETAILS:

Published on 3 February 2026

ABSTRACT:

In the field of computer science speech recognition play vital role. Speech is nothing but primary means of communication in the field of speech recognition. This paper described a Framework for identifying speakers of isolated vocabulary of Ahirani spoken language. In this research article main focused is on Ahirani spoken language which is spoken in Maharashtra state from Khandesh Region. Speech database is collected from native speakers. Database is consisting of 300 Spoken Ahirani isolated words. Hidden Markov Model is used with Gaussian Mixture Model. Mel – Frequency Cepstral Coefficient (MFCC) is used as speech feature extraction method. Total 39 MFCC features are extracted. Using HMM mixing with Gaussian mixture is the first step towards to develop IVRS system for Spoken language. Experimental work is performed using four native speakers. Model is trained in speaker dependent environments. Word error rate is calculated 3.46%.

Link: https://doi.org/10.1007/978-3-032-10664-3_6

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A Graph-Based Enhanced Key Chain Mechanism for a Robust Secure Data Transmission

AUTHOR :

Arora, J.; Sharma, S.; Gupta, R.

JOURNAL NAME:

Lecture Notes in Electrical Engineering (vol.-1459 LNEE)

DETAILS:

Published on 1 February 2026

ABSTRACT:

The safety measure of data communication is its encryption to prevent unauthorized access during transit over the Internet. Security of cryptographic keys from intrusions is among the top security concerns. To transmit secret data, data security algorithms apply cryptography techniques with suitably decided common keys in a session. The algorithms that are cryptographically secured must maintain confidentiality by using session-based common keys. This raises another issue: secure sharing of these keys among nodes. Trusted Third Party (TTP) is, therefore, the only primary solution for secure key exchange. The security of the key is ensured by continuously updating its value based on some graph nodes. The message can be securely transmitted through the graph-based key chain mechanism. This paper introduces a graph-based key chain mechanism to strengthen data transmission security. Using cyclic graph traversal and trusted third-party key exchange sharing, a proposed framework keeps updating its keys dynamically to circumvent the potential breaches. The result shows more security with less vulnerability than the traditional method. A detailed analysis of key generation for data encryption is thus closely tied to the underlying graph traversal methodology.

Link: https://doi.org/10.1007/978-981-96-9716-8_26

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Introduction and Mechanisms of Various Nanocomposites and Their Advantages and Disadvantages

AUTHOR :

Bhavani, B.; Baheti, A.M.; Pawar, A.T.; Setty, V.; Chandrasekar, S.B.

JOURNAL NAME:

Nanocomposites and Nanomaterials in Biomedical Applications

DETAILS:

Published on January 2026

ABSTRACT:

Nanocomposites are multifunctional materials that combine nanoparticies with a matrix, enabling precise control over drug release kinetics, improved drug solubility, improved bioavailability, targeted delivery, and sustained release. Several mechanisms govern their performance which collectively influences drug release profiles. The stimuli-responsive behavior of nanocomposites elucidates the mechanism of drug release. The electric field, temperature, light, pH, and specific molecules are the most frequently occurring stimuli. Nanocomposites show unique mechanical, thermal, and electrical characteristics. They are used in several ways for energy storage and harvesting, defence aerospace and safety, environment remediation, electronics, food and agriculture, automobiles, textiles, and biomedical medicines.

Link: https://doi.org/10.1201/9781779641236-1

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Machine Learning Based Detection Mechanism for Sensor Spoofing in Autonomous Vehicles

AUTHOR :

Musale, V.; Patekar, R.; Kumar, A.; Shaikh, A.; Gupta, S.; Amune, A.; Bedekar, M.

JOURNAL NAME:

Communications in Computer and Information Science (Vol.-2736CCIS)

DETAILS:

Published on 31 January 2026

ABSTRACT:

Autonomous driving technologies, which allow cars to function without hu-man involvement, are revolutionizing the transportation sector. Different types of sensors, such as cameras, LIDAR, and radar, combined with advanced control algorithms are incorporated in this system to navigate and manage critical vehicle functions. Despite this, autonomous vehicles (AVs) are susceptible to security vulnerabilities, including sensor spoofing. Sensor spoofing involves manipulating sensor data to deceive the vehicle's view of its environment.

This paper suggests a thorough security framework that brings together hardware authentication methods, sensor validation strategies using Machine Learning and secure Vehicle-to- Everything (V2X) communication. This strategy guarantees the integrity of sensor data, reducing the dangers of cyberattacks on autonomous driving systems. Moreover, a comparison and evaluation of current security techniques are given, which demonstrates the improvements made by the suggested approach. The findings show enhanced detection of sensor spoofing, which helps to maintain the communication smoothly.

Link: https://doi.org/10.1007/978-3-032-14531-4_51

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Gesture Control System for Drones: Enhancing Human-Drone Interaction Through Real-Time Machine Learning and Depth Sensing

AUTHOR :

Kalro, S.P.; Pereira, S.S.; Kirloskar, S.M.; Shringare, V.D.; Patil, S.; Pai, A.R.

JOURNAL NAME:

Communications in Computer and Information Science (Vol.-2736CCIS)

DETAILS:

Published on 31 January 2026

ABSTRACT:

Gesture control systems are becoming vital across industries due to their ability to strengthen user interaction, accessibility, and provide innovative ways of interfacing with technology. As these systems continue to grow, they will likely become an indispensable component of user interfaces across a wide range of applications. In this work, a Gesture Control System is designed and implemented to enhance the human-drone interaction paradigm. The proposed system leverages machine learning techniques to interpret and respond to user-defined gestures, providing a seamless and natural interface for controlling drones. The work begins with an exploration of existing gesture recognition methodologies and their limitations, leading to the development of a robust model tailored for drone control. This is implemented as a real-time image processing pipeline that captures and interprets gestures using a combination of depth sensing and machine learning, enabling users to convey complex commands effortlessly. The methodology involves integrating a ground station system with the drone controller, which captures live video data to be processed by the gesture recognition algorithm in real-time. The machine learning model, trained on a diverse dataset of gestures, accurately classifies user-defined commands, allowing for precise and responsive drone control. The system's performance is assessed through a series of experiments, evaluating its accuracy, latency, and reliability in various environmental conditions.

Link: https://doi.org/10.1007/978-3-032-14531-4_42

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Application of Blockchain in the Healthcare Industry Using Nanotechnology to Detect Cancer

AUTHOR :

Apte, M.; Shukla, P.P.; Patil, A.R.; Chavali, M.; Faheem, S.M.

JOURNAL NAME:

Contributions to Management Science (Vol.-Part F 1425)

DETAILS:

Published on 3 February 2026

ABSTRACT:

Blockchain has provided solutions to security issues and many other industries in which healthcare takes a major share, especially for storing cancer patient's records. Nanotechnology is one of the popular diagnostic methods to detect the early stages of cancer cells, possible to have vivo imaging as it gives a brilliant sensitivity-specific multiplexed measuring capacity. In comparison to conventional diagnostic techniques, cancer nanodiagnostics is a cutting-edge approach to the early detection and surveillance of cancer. Data security, privacy, and the smooth sharing of information among stakeholders, including patients, healthcare providers, and researchers, are some of the issues that this area continues to encounter as it develops. By overcoming these difficulties, blockchain technology, which is renowned for being decentralized and secure, has the potential to revolutionize cancer nanodiagnostics. Today, blockchain technology has developed to a point where it can be explored for use in a variety of other sectors, such as the management of cancer registries. It takes a lot of time and coordination between many levels of data-collecting jurisdictions to gather and handle the cancer diagnostic and treatment data as required by law in many localities. Cancer therapies employ a variety of nanotools, including inorganic, organic, and polymeric nanomaterials. Nano methods have demonstrated many benefits: they are more effective, sensitive, and dependable; they avoid drug resistance; they only need small amounts of pharmaceuticals; they have low toxicity; and they are site-specific. A continuously updated and comprehensive picture of the patient's information made possible by blockchain can serve as a foundation for better decision-making, ultimately enhancing patient value and adding value to the healthcare industry. Decentralized applications with incorporated smart contract capabilities can be created on top of an interoperable blockchain-based IT system architecture for medical data and run well.

Link: https://doi.org/10.1007/978-981-95-2337-5_8

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Metro operation optimization using predictive maintenance models

AUTHOR :

Singh, D.P.; Desai, S.; Shivhare, A.; Mahajan, S.; Pandit, A.K.

JOURNAL NAME:

Futuristic Information and Communication: A Multimodal Multidisciplinary Signal Analysis

DETAILS:

Published on February 2026

ABSTRACT:

This study presents a predictive maintenance framework aimed at optimizing metro rail operations by focusing on the MetroPT3 air compression unit-a critical component in urban transit systems. We employ advanced deep learning models to forecast system failures using a six-month, high-frequency sensor dataset containing over 1.1 million records. Through rigorous preprocessing, including outlier removal and standardization, the dataset was refined to 400, 000 high-quality entries. The predictive framework is built on two state-of-the-art time-series models: Long short-term memory (LSTM) networks and Transformer architectures. LSTM leverages gated memory units to retain sequential context, while Transformers utilize attention mechanisms to capture complex, long-range dependencies efficiently. Our approach includes signal acquisition, feature engineering, temporal modeling, and model evaluation using metrics such as accuracy, mean squared error (MSE), and R-squared. Experimental results demonstrate that while LSTM achieves moderate forecasting accuracy (~74%), the Transformer model outperforms it significantly, achieving 85% accuracy, superior generalization, and faster convergence. The overall workflow of this predictive maintenance framework is depicted in Figure 24.1.

Link:
https://www.scopus.com/pages/publications/105029323686?origin=resultslist

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Examining Antecedents of AI-integrated Digital HRM Adoption in Indian SMEs

AUTHOR :

Srivastava, S.P.; Himanshu

JOURNAL NAME:

Millennial Asia

DETAILS:

Published on 27 January 2026

ABSTRACT:

The study aims to assess the relative prominence of antecedents responsible for the adoption of digital AI-integrated human resource management (HRM) in small, and medium enterprises (SMEs). The present study has employed the technological–organizational and environment (TOE) framework to identify and categorize the antecedents and their sub-antecedents through an extensive literature review. Further, the fuzzy analytic hierarchy process was employed with a sample of 140 human resource professionals to prioritize the antecedents and their sub-antecedents. In a first for HRM in the context of findings, the sub-antecedents prioritized were the technical interface of software and application, data integrity, competitiveness and relative advantage in the market. Despite government efforts to build a digitally skilled workforce, regulatory compliance for IT security at the SME level remains a gap. The study advocates that policymakers at the government level ensure regulatory compliance for each SME unit to ensure IT-based security. This study has contributed to a theoretical understanding of adopting disruptive technologies for HRM in SMEs. While existing literature emphasizes technology antecedents, the present study underscores the criticality of previously underexplored key sub-antecedents.

Link: https://doi.org/10.1177/09763996251409324

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

AI-Driven Failure Recovery in Pharma Supply Chains Using Deep Q-Networks

AUTHOR :

Joshi, S.; Behele, S.; Soni, S.; Kumar, A.; Raut, U.

JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.- 1711 LNNS)

DETAILS:

Published on 29 January 2026

ABSTRACT:

The pharmaceutical sector faces increasing vulnerability to supply chain disruptions, with significant implications for both healthcare delivery and operational efficiency. Conventional supply chain management frameworks often fall short when confronted with unexpected failures, highlighting the necessity for sophisticated real-time recovery mechanisms. This investigation introduces NEXUS, an artificial intelligence framework that employs Deep Q-Networks (DQNs) to autonomously identify, address and mitigate failures within pharmaceutical supply networks. The framework transforms complex supply chain data into optimized four-dimensional feature vectors that encapsulate critical information regarding feature selection, stability monitoring, constraint identification and anticipatory resilience. By integrating concepts from information theory, statistical divergence assessment and reinforcement learning methodologies, NEXUS facilitates adaptive decision-making that responds to evolving conditions in real-time. Our experimental results demonstrate that NEXUS achieves up to 76% node recovery within 135 steps, with a 93% service level during normal operations and 64% service level maintenance even during black swan events - significantly outperforming traditional approaches. Unlike traditional rule-based approaches, our methodology continuously refines recovery strategies based on historical performance metrics. This paper establishes the mathematical foundations of NEXUS, presents a detailed implementation algorithm and outlines evaluation methodologies across diverse pharmaceutical supply chain scenarios including baseline operations, periodic demand fluctuations, progressive system deterioration, unexpected demand spikes and catastrophic events.

Link: https://doi.org/10.1007/978-3-032-10667-4_35

Since 1983

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Intelligent Congestion Control Mechanism for IoT-Enabled Wireless Sensor Networks Using Hybrid Aggregation and Scheduling Technique

AUTHOR :

Sutar, S.H.; Jinila, Y.B.; Patil, K.; Dash, S.; Jadhav, S.

JOURNAL NAME:

Journal of Visualized Experiments (Vol.-2026, Issue-227)

DETAILS:

Published on 13 January 2026

ABSTRACT:

Congestion in IoT-enabled wireless sensor networks (WSNs) degrades packet delivery, latency, and energy usage, impairing the network, especially under bursty and heterogeneous traffic conditions. This protocol illustrates an intelligent congestion control technique that combines hybrid data aggregation, adaptive scheduling, and a neuro-fuzzy decision engine to efficiently handle network load. The method involves first generating simulation data, creating topologies of different node densities, and setting up traffic patterns using NS-2.35. Packet traces are obtained for each scenario to allow reproducible evaluation. The protocol workflow refers to the combination of two mechanisms: (1) hybrid aggregation, which combines packets in time- and count-based windows while retaining priority labels, and (2) adaptive scheduling, which handles dual priority queues via weighted round robin. A neuro-fuzzy controller always evaluates buffer occupancy, link quality, channel utilization, residual energy, and traffic priority. Taking these inputs, it regulates aggregation depth, queue weights, and transmission decisions by fuzzy inference and neuro-adaptive learning. Performance measurement tasks encompass the calculation of packet delivery ratio, end-to-end latency, throughput, node-level energy consumption, and network lifetime. Statistical analyses are performed across multiple runs to check the reliability of the results. The approach reveals better performance in the simulation compared to the baseline schemes. This protocol offers a reproducible framework for exploring hybrid congestion control methods that enable energy-efficient, scalable, and QoS-aware operation in IoT-enabled WSN environments.

Link: https://doi.org/10.3791/69909

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Hybrid Supercapacitor Performance Through Electrode Composites: Ti3C2Tx Anode and Fe3O4@Activated Carbon Cathode Integration

AUTHOR :

Kakade, P.M.; Kachere, A.R.; Pandey, S.S.; Aher, R.; Sartale, S.D.; Jadkar, S.R.; Ruz, P.; Sudharshan, V.; Sharma, R.; Kim, H.; Mandlik, N.T.; Bulakhe, R.N.; Kim, J.M.

JOURNAL NAME:

Energy Technology (vol.-14, Issue-1)

DETAILS:

Published on 29 January 2026

ABSTRACT:

Here, we report the performance of an asymmetric supercapacitor (ASC) fabricated using a chemically synthesized Ti3C2Tx MXene as an anode, a ferric oxide (Fe3O4) (magnetite), and biomass-derived activated carbon (AC) composite (MAC composite) as a cathode, 2 M potassium hydroxide (KOH) as an electrolyte. Ti3C2Tx MXene synthesis was carried out using chemical etching processes using synthesized Ti3AlC2 MAX phase. AC was synthesized using biomass (coconut shell) by carbonization and activation processes. Whereas MAC composite was prepared using the solvothermal method. Physiochemical characteristics of all samples were analyzed using X-ray diffraction, Raman spectroscopy, field emission scanning microscopy, and HR-TEM techniques. Specific surface areas of Ti3C2Tx MXene and MAC-7.5 was found to be 85.37 and 434.35 $m^2 g^{-1}$, respectively. The attained specific capacitance values for bare Ti3C2Tx MXene and MAC-7.5 composite are 173 F g^{-1} at 1 A g^{-1} and 1722 A g^{-1} at 2 A g^{-1} current density, respectively. Electrochemical performance of the developed ASC device displayed a 133.47 F g^{-1} specific capacitance at a current density of 1 A g^{-1} with the maximum energy and a power density of 41.71 and 512 W kg^{-1}, respectively. Stability performance of the ASC showed the highest retention rate of 94% after 5000 cycles.

Link: https://doi.org/10.1002/ente.202501914

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Psychosocial Engagement in Crisis: Role of Stress, Social Support and Meaning in Activity Choices During Lockdown

AUTHOR :

Taywade, A.; Sharma, P.

JOURNAL NAME:

International Research Journal of Multidisciplinary Scope (Vol.-7, Issue-1)

DETAILS:

Published on January 2026

ABSTRACT:

The COVID-19 lockdown changed people's lives suddenly and completely, forcing them to stay indoors and adjust to a new way of living. This study unfolds interesting facts about psychosocial engagement in medical crisis by exploring their leisure activity choices and the psychosocial factors influencing them—specifically, perceived stress, social support, and meaning in life. Research was conducted during the first phase of lockdown covering a total of 304 people across India, highlighted people's experiences within home restriction on the leisure activities and their relationship with other psychosocial domains through an online web-based survey. Common leisure activities included social media use (62.2%), cleaning the house (52.3%), communicating with friends and family (55.3%), and learning new skills (54.6%). Factor analysis identified three categories of leisure engagement: fun and social activities, learning and skill development, and self-care. Regression results indicated that perceived stress and social support significantly predicted engagement in fun and social activities, while sense of meaning in life was a significant predictor of both self-care and skill development. The study highlights the role of leisure as a coping mechanism during collective crises, illustrating how individuals recalibrate their behaviors in response to psychological needs and social contexts. The study helps to understand the dynamic nature of psychosocial engagement with respect to the gravity of stress, perceived social support, and meaning in life, facilitating navigation through rough phases of the collective natural adversity within defined safe spaces like home.

Link: https://www.irjms.com/journal/psychosocial-engagement-in-crisis-role-of-stress-social-support-and-meaning-in-activity-choices-during-lockdown/

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Gender board diversity and financial performance: evidence from India's mandatory gender quota

AUTHOR :

Patil, A.; Yadav, R.

JOURNAL NAME:

International Journal of Disclosure and Governance

DETAILS:

Published on 27 January 2026

ABSTRACT:

This study examines the relationship between gender board diversity and financial performance using a comprehensive dataset of 2,341 Indian listed companies from 2009 to 2023. Exploiting India's 2013 mandatory gender quota requiring at least one woman director on corporate boards, we employ a difference-in-differences approach to identify causal effects. Our findings reveal a positive and significant relationship between gender diversity and financial performance, with firms experiencing a 4.2% increase in ROA and 3.8% increase in ROE following compliance with the mandate. The effects are particularly pronounced for family-controlled firms, technology companies, and firms with previously all-male boards. Cross-sectional analysis reveals that benefits are strongest when women directors possess relevant expertise and independence. We find evidence supporting both human capital and signaling theories, with improved board monitoring and enhanced stakeholder relationships serving as key transmission mechanisms. These results contribute to the ongoing debate on mandatory diversity policies and provide valuable insights for emerging market contexts where traditional governance structures predominate.

Link: https://doi.org/10.1057/s41310-026-00357-z

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Secure image transmission using chaotic encryption and DWT watermarking on reconfigurable platform

AUTHOR :

Salunkhe, S.; Mulani, A.O.; Shahane, D.; Rana, M.; Shukla, S.M.; Jadhav, M.M.

JOURNAL NAME:

Journal of Discrete Mathematical Sciences and Cryptography (Vol.-29, Issue-1)

DETAILS:

Published on 13 January 2026

ABSTRACT:

With the exponential rise in digital image transmission across unsecured networks, ensuring image confidentiality and authenticity has become essential. Traditional cryptographic methods like AES provide strong confidentiality but lack built-in authentication mechanisms. On the other hand, digital watermarking, especially in the Discrete Wavelet Transform (DWT) domain, offers robust image authentication. Combining both techniques and deploying them on reconfigurable platforms such as FPGAs addresses the growing demand for secure, high-performance image communication systems. This paper presents a hybrid image authentication framework that integrates AES encryption for confidentiality and DWT-based invisible watermarking for authenticity. The process involves preprocessing the image, applying AES encryption, embedding a watermark in the high-frequency sub-bands of the DWT domain, and implementing the system on an FPGA using Verilog HDL. The AES and DWT modules are designed as separate cores, synthesized, and verified using Xilinx tools on Spartan-6 FPGA. The watermark, encrypted if necessary, is embedded in the HH sub-band to ensure robustness and imperceptibility. Simulations conducted on standard grayscale images (e.g., Lena, Cameraman) demonstrate high image fidelity, with PSNR exceeding 40 dB and SSIM values above 0.95. The watermark remained resilient under Gaussian noise, JPEG compression, and median filtering, with a bit error rate below 2%. FPGA implementation showed efficient resource utilization, consuming 4321 LUTs and 2176 flip-flops, with a total power consumption of 354 mW and latency of 1.02 µs. These results confirm the system's real-time suitability and robustness. The proposed hybrid image authentication system successfully ensures both security and authenticity in an image.

Link: https://doi.org/10.47974/JDMSC-2608

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Soil Microbiome Legacies of Long-Term Pesticide Use and Implications for Plant–Insect Interactions in Agroecosystems

AUTHOR :

Puthillath, B.; Harish, C.; Latha, A.; Sudan, P.; Werulkar, J.D.; Anand, D.; Bhardwaj, U.

JOURNAL NAME:

Natural and Engineering Sciences (Vol.-11, Issue-1)

DETAILS:

Published on 15 January 2026

ABSTRACT:

The use of pesticides on a long-term basis is a characteristic feature of the contemporary agroecosystems, yet the long-term consequences of this practice on soil microbial communities and their subsequent impact on the interactions between plants and insects is too under researched. This paper investigates the remodeling of soil microbiome structure and capability triggered by chronic exposure to pesticides, and the subsequent belowground features that are transmitted to influence physiological properties in plants and insect herbivores. Agricultural fields which had a history of continuous pesticide application (termed more than ten years) as well as fields under reduced pesticides management were both used to collect soil samples. Through high throughput sequencing of bacterial (16S rRNA) and fungal (ITS) communities, diversity of the microorganisms, community structure and functional pathways were characterized. Growth of plants in heritage soils was measured, and inducible defense responses and volatile organic compounds emissions of the plants were measured together with insect behavior, performance and development of the chosen herbivores. Prolonged exposure of pesticides resulted in a profound decrease in microbial diversity, distortion of the complexity of communal networks, and nascent functionality gene pattern depending on nutrient cycling and modulating plant protection. These alterations in the microbiome have been linked to inhibited plant defensive reactions and adapted volatile dialog, which lead to an improved rate of feeding and functioning of herbivores. The findings indicate that the extensive use of pesticides generates long-term legacies in the forms of enduring microbiome that reorganize beneath the soil surface-zenith interactions and determine multitrophic relationships. The results demonstrate the necessity to consider the dynamics of soil microbiomes as a component of the pest management and agricultural sustainability systems and note that the long-term use of chemicals can have unregulated ecological implications that are not limited to what the chemical is intended to do.

Link: https://nesciences.com/article/72972/

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

A Clinically Translatable Multimodal Deep Learning Model for HRD Detection from Histopathology Images

AUTHOR :

Uttarwar, M.; Khandare, J.; Shivamurthy, P.M.; Satpute, A.; Panwar, M.; Kothavade, H.; Ramesh, A.; Iyer, S.; Shafi, G.

JOURNAL NAME:

Diagnostics (Vol.-16, Issue-2)

DETAILS:

Published on 21 January 2026

ABSTRACT:

Background: With extensive research and development in the past decade, the affordability of Poly (ADP-ribose) polymerase (PARP) inhibitor therapy has drastically improved. Homologous recombination deficiency (HRD), a key biomarker, has been identified as an important guiding factor for PARP inhibitor therapeutic decisions in breast and ovarian cancer. However, identification of patients who will respond to Poly (ADP-ribose) polymerase (PARP) inhibitor therapy is challenging due to the lack of a unifying morphological phenotype. Current HRD testing via next-generation sequencing (NGS) is tissue-dependent, has high failure rates, misses relevant HRD genes, and involves longer turn-around times. Methods: To overcome these limitations, we developed a multimodal AI model, TRINITY, combining imaging, image-based transcriptome data, and clinico-molecular data, to examine whole-slide images (WSIs) obtained from hematoxylin and eosin (H&E)-stained samples to non-invasively predict HRD status. Results: The TRINITY model, tested on 316 TCGA breast and OV samples, presented a sensitivity of 0.77 and 0.91, NPV of 0.94 and 0.86, PPV of 0.63 and 0.58, specificity of 0.89 and 0.47, and AUC-ROC of 0.91 and 0.72, respectively. The model also yielded a similar outcome in a blind study of 74 samples, with a sensitivity of 81.2, NPV of 0.85, PPV of 0.77, specificity of 0.81, and high AUC-ROC value of 0.89, showing its promising preliminary evidence of predicting HRD status on external cohorts. Conclusions: These findings demonstrate TRINITY's potential as a rapid, cost-effective, and tissue-sparing alternative to conventional NGS testing. While promising, further validation is needed to establish its generalizability across broader cancer types.

Link: https://doi.org/10.3390/diagnostics16020356

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Ultrasonic-Assisted Degradation of Metformin from Pharmaceutical Effluent: Process Optimization via Response Surface Methodology

AUTHOR :

Dehankar, S.P.; Joshi, R.R.

JOURNAL NAME:

Journal of Environmental Health and Sustainable Development (Vol.-10, Issue-4)

DETAILS:

Published on 30 December 2025

ABSTRACT:

Introduction: Metformin, an extremely prescribed antidiabetic medication, is discharged with minimal or no processing and remains during the usual wastewater treatment procedures. Advanced oxidation processes (AOP), especially ultrasound-enabled oxidation, are catalyst- and sludge-free reaction pathways for degrading recalcitrant pharmaceuticals. This study aimed to (i) determine the ultrasound-assisted degradation of metformin using hydrogen peroxide, (ii) determine the effect of the main operation parameters, and (iii) optimize the chemical oxygen demand (COD) and total organic carbon (TOC) using Response Surface Methodology (RSM).

Materials and Methods: Five process parameters were optimized: pH (3-9), ultrasonic power (60-150 W), sonication time (10-60 min), H_2O_2 concentration (0-1.0 mL/L), and initial metformin concentration (5-50 mg/L). Dual response variables, including COD and TOC removal, were analyzed via quadratic polynomial regression. Metformin concentration was quantified using high-performance liquid chromatography at a detection wavelength of 240 nm.

Results: Optimal operating conditions were identified as pH 3.5, ultrasonic power 110 W, sonication time 40 min, and H_2O_2 concentration 0.65 mL/L, achieving 94.5% COD removal, 88.3% TOC removal, and 97.2% metformin degradation. Both statistical models demonstrated high significance ($p < 0.0001$) with a coefficient of determination $R^2 > 0.96$ and a composite desirability of 0.9845 (98.45%), confirming excellent multi-response optimization.

Conclusion: Metformin significantly reduced the organic load, and the drug was significantly degraded by ultrasonic-assisted oxidation. The optimization method based on RSM offers predictive models that can be used to design the process or the performers.

Link: https://publish.kne-publishing.com/index.php/JEHSD/article/view/20656

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

The Transmuted Komal Distribution: Properties, Estimation, and Real-World Applications

AUTHOR :

Ranade, S.; Rather, A.A.; Aljarrah, M.; Vedavathi Saraja, D.V.; Parveen, S.M.

JOURNAL NAME:

Lobachevskii Journal of Mathematics (Vol.-46, Issue-10)

DETAILS:

Published on 17 February 2026

ABSTRACT:

Accurate statistical modeling is crucial in diverse fields such as engineering and biomedical sciences. In this study, we analyze two real-world datasets one from an engineering domain, representing system reliability data, and another related to chemotherapy and radiation treatment, capturing survival patterns in medical research. Existing distributions often fail to provide an optimal fit for such data sets, necessitating the development of more flexible models. To address this, we propose the transmuted Komal distribution as an extension of the one-parameter Komal distribution and explore its key statistical properties, including moments, the likelihood function, the hazard rate function, maximum likelihood estimation, order statistics, and reliability analysis. The empirical results highlight the effectiveness of the transmuted Komal distribution in capturing complex data structures, making it a valuable addition to the family of generalized probability distributions.

Link: https://doi.org/10.1134/S1995080225609658

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

A Novel Statistical Approach to COVID-19 Data Using the Exponentiated Komal Distribution

AUTHOR :

Ranade, S.; Rather, A.A.; Alotaibi, E.S.

JOURNAL NAME:

Lobachevskii Journal of Mathematics (Vol.-46, Issue-10)

DETAILS:

Published on 17 February 2026

ABSTRACT:

In this article, we introduce the exponentiated version of the Komal distribution, developed and analyzed in the context of COVID-19 data applications. This extended distribution is proposed to enhance flexibility and applicability in modeling real-world data, particularly in pandemic-related scenarios. We derive various fundamental statistical properties of the exponentiated Komal distribution, including its survival function, hazard rate function, reversed hazard rate function, moments and order statistics. Furthermore, the parameters of the proposed distribution are estimated using the maximum likelihood estimation (MLE) method, ensuring robust statistical inference. To validate the practical utility and efficiency of the model, we apply it to an actual COVID-19 dataset. The results demonstrate that the exponentiated Komal distribution provides an improved fit and deeper insights into the underlying patterns of pandemic-related data. The results highlight its superior ability to model and analyze pandemic-related data, making it a valuable tool for statistical modeling in epidemiological research.

Link: https://doi.org/10.1134/S1995080225609671

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।। विश्वशान्तिर्ध्रुवं ध्रुवा ।।

TITLE:

Microforming Stainless Steel 304: Experimental And Numerical Integration

AUTHOR :

Khatavkar, S.; Kakandikar, G.M.; O.

JOURNAL NAME:

Russian Journal of Biomechanics (Vol.-29, Issue-2)

DETAILS:

Published on June 2025

ABSTRACT:

This research investigates the microforming behaviour of SS304 stainless steel, fo-cusing on the influence of rolling direction. Known for its strength and ductility, SS304 is crucial for manufacturing miniaturized components. Experimental analyses involve Nakajima testing on SS304 samples at 0°, 45° and 90° using a universal testing machine, with formability parameters measured using a Sipcon CNC vision measurement system. Parallel numerical simulations with Simufact Forming software generate forming limit curves to predict critical deformation points. Comparative analysis reveals consistent trends in microforming behaviour, highlighting the anisotropic properties of SS304 due to rolling direction. Key findings include critical strain values and microstructural chang-es during forming, which are essential to optimize microforming processes. The integra-tion of both approaches provides a comprehensive understanding of the formability lim-its and deformation mechanisms of SS304. This study highlights the significant potential for the advancement of microforming techniques in various industrial applications, par-ticularly those requiring precise miniaturized components, and highlights the importance of combining experimental and numerical methods for a deep understanding of material behaviour.

Link:
https://www.scopus.com/pages/publications/105015538352?origin=resultslist

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Self-Adaptive Artificial Intelligence System for Context-Aware Problem Solving and Data-Driven Decision Optimization

AUTHOR :

Madugula, N.R.; Aljawarneh, N.M.; Kulkarni, K.G.; Kalita, N.; Sajiv, G.; Ponni Valavan, M.

JOURNAL NAME:

International Conference on Intelligent Communication Networks and Computational Techniques, ICICNCT 2025

DETAILS:

Published on 18 November 2026

ABSTRACT:

The present need for real-time optimization and choices makes standard AI systems hard to adjust when facing ambiguous situations. The path optimization and problemsolving software tool ACO shows widespread use however it encounters premature convergence issues as well as flexibility restrictions. Fuzzy logic handles uncertainties effectively yet it does not have strong learning abilities or optimization methods. The presented research creates a new self-adaptive AI system by uniting ACO with fuzzy logic for enhancing decision-making abilities which adapt to changing environmental conditions. Through the proposed hybrid model the pheromone updating bounds operate using fuzzy-controlled mechanisms alongside probabilistic selection methods that automatically modify evaporation parameters and selection weights through the detection of live environmental conditions. The approach improves both exploration-exploitation equilibrium and problem-solving speed together with solution efficiency. The system undergoes evaluation through benchmarking that matches traditional ACO and alternative optimization algorithms while showing maximal accuracy levels and excellent adaptability features and computational efficiency outcomes. Real-life applications of the fuzzy logic-based ACO system are demonstrated in logistics as well as healthcare and IoT-based decision systems and these applications show its feasibility at different scales. Experimental tests validate that fuzzy logicbased advancements in ACO promote outstanding results in highly complex situations combined with dynamic problem spaces. The research demonstrates how combinatorial AI methods can autonomously learn while optimizing real-time operations which creates the foundation for future AI-driven choice systems across multiple industrial sectors.

Link:
https://doi.org/10.1109/ICICNCT66124.2025.11232985

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

AI Enabled Stethoscope for Initial Diagnosis

AUTHOR :

More, A.; Mishra, R.; Chaware, T.

JOURNAL NAME:

INDISCON 2025 - IEEE 6th India Council International Subsections Conference, Proceedings

DETAILS:

Published on 2 December 2025

ABSTRACT:

Cardiovascular diseases (CVDs) remain the leading cause of mortality globally, making early detection and intervention critical. While traditional stethoscopes are indispensable in clinical practice, their effectiveness is heavily dependent on the clinician's auditory skills and experience. This reliance often leads to inconsistent diagnoses, especially in resource-limited settings. To address these limitations, this paper presents "AI Stethoscope," a low-cost, intelligent stethoscope system that leverages artificial intelligence for real-time heartbeat classification. Our system utilizes a USB microphone connected to a Raspberry Pi 4 to capture live heart sounds. The recorded audio undergoes preprocessing (noise reduction, amplification, and normalization), followed by MFCC feature extraction. A lightweight CNN model trained on labelled heartbeat sounds classifies each recording into Normal, Murmur, or Extrasystolic. The model is converted into TensorFlow Lite format for efficient real-time inference. All processing occurs locally on the Raspberry Pi, with results displayed via terminal.

Link:
https://doi.org/10.1109/INDISCON66021.2025.11251634

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Machine-learning driven bias reductions of ERA5 surface air temperatures for metropolitan environments in Western India

AUTHOR :

Iyer, S.; Prajapati, S.; Kulkarni, S.; Joy, R.M.

JOURNAL NAME:

INDISCON 2025 - IEEE 6th India Council International Subsections Conference, Proceedings

DETAILS:

Published on 2 December 2025

ABSTRACT:

This study examines the prospects of machine learning (ML) approaches to bias adjustments in the ERA5-diagnosed daily maximum temperature (Tmax) and minimum temperature (Tmin) datasets suitable for the metropolitan cities (Mumbai and Pune) located in coastal and valley environments of western India. ERA5 datasets tend to exhibit a cold [warm] bias in Tmax [Tmin] to which the corrections are applied using quantile mapping (QM) and ML predictions are carried out using a set of 18 predictors targeted against the observed daily Tmax and Tmin . The results from this investigation emphasize that ML predictions clearly outperform in reducing the biases compared to QM. ML models tend to reproduce observed variance in the temperature fields with a 3-fold reduction in root-mean square errors better than QM. The results also suggest that ML-based bias corrections show better efficiency and a correction of about ±2∘C to the ERA5 diagnosed maximum and minimum temperature fields can be suitable for impact assessments in the coastal and valley environments of western India.

Link:
https://doi.org/10.1109/INDISCON66021.2025.11254439

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

PresencePro: Analytics-Driven Face Recognition Attendance System

AUTHOR :

Badgujar, G.; Rane, R.; Chaher, A.; Chirutkar, A.; Shekh, S.

JOURNAL NAME:

2025 3rd World Conference on Communication and Computing, WCONF 2025

DETAILS:

Published on 17 November 2025

ABSTRACT:

Automated attendance tracking based on face recognition has been suggested as a very effective way to replace the old and inaccurate ones. This paper details a Python-based and quite reliable attendance system which benefits a user-friendly user interface using Tkinter to help the student with real-time facial recognition. The system employs the Local Binary Pattern Histogram (LBPH) algorithm of OpenCV for the identification of the person accurately. Therefore, a password-protected registration is adopted to make sure only authorized people can add users and ensure the security of the data. In the attendance process, the exact recording time is stored in daily CSV files and displayed in a tabular form for easier confirmation. Due to the fact that the system is designed to be very user-friendly, it can be very easily used by people with very little technical experience. Thus, combining computer vision with the design of the system is going to make the approach particularly safe and easily scalable. With the help of a well-optimized computer vision part, companies, schools, and other organizations are able to benefit from this solution by making it both highly secure and easily adaptable according to the situation.

Link: https://doi.org/10.1109/WCONF64849.2025.11233622

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

SmartDrive: A Low-Cost, Edge AI-Powered Advanced Driver Assistance System for Emerging Markets

AUTHOR :

Lomte, N.; Palshikar, K.; Wakankar, S.; Kholkute, S.; Motade, S.N.

JOURNAL NAME:

2025 3rd World Conference on Communication and Computing, WCONF 2025

DETAILS:

Published on 17 November 2025

ABSTRACT:

SmartDrive is a compact and cost-effective Advanced Driver Assistance System (ADAS) developed using the Raspberry Pi 4B. By integrating real-time object detection via YOLOv8, ultrasonic distance sensing, and GPS-based tracking, the system aims to enhance vehicular safety in complex and crowded traffic environments. A live dashboard visualizes camera feeds, sensor data, and system events, while actuator-controlled brake mechanisms are employed to simulate autonomous responses. SmartDrive is tailored for real-world Indian roads, highlighting the convergence of edge AI and embedded systems to promote safer, smarter mobility for everyday users.

Link: https://doi.org/10.1109/WCONF64849.2025.11233283

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Combining KM and Technological Innovation

AUTHOR :

Varshney, N.; Dixit, K.

JOURNAL NAME:

International Encyclopedia of Business Management

DETAILS:

Published on January 2026

ABSTRACT:

Knowledge Management (KM) and technological innovation in driving organizational success. By effectively capturing, sharing, and leveraging knowledge assets, KM empowers organizations to foster innovation, enhance decision-making, and sustain competitive advantage. Coupled with technological innovation, KM serves as a catalyst for transformative change, enabling organizations to adapt to dynamic market conditions and capitalize on emerging opportunities. Through a culture of collaboration and continuous learning, organizations can leverage KM and technological innovation to drive operational excellence, spur growth, and establish themselves as leaders in their respective industries.

Link: https://doi.org/10.1016/B978-0-443-13701-3.00286-3

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॥ विश्वशान्तिर्ध्रुवं ध्रुवा ॥

TITLE:

Challenges and Future Prospects in the Field of Microbial Pigments to liquid biopsy

AUTHOR :

Joshi, A.; Purandare, D.; Bhope, A.; Chaudhari, S.; Patil, A.; Satish, S.

JOURNAL NAME:

Biopigments of Microbial Origin: Innovations and Applications Across Industries

DETAILS:

Published on 12 January 2026

ABSTRACT:

Microbial pigments have emerged as a sustainable alternative to synthetic dyes, gaining recognition across food, pharmaceuticals, cosmetics, and textile industries. These pigments offer bioactive properties, including antimicrobial, antioxidant, antiinflammatory, and photoprotective effects, making them desirable for health-related and eco-friendly innovations. The transition from synthetic to natural pigments faces challenges in production efficiency, stability, and regulatory acceptance. The cost-effectiveness and scalability of cultivating microbial pigments and ensuring consistent quality remain key hurdles. Current advancements focus on genetic engineering, optimizing fermentation processes, and exploring novel microbial strains from bacteria, fungi, yeasts, and microalgae. Future prospects aim to enhance yield, improve stability, and tailor bioactivity for specific industry needs. Microbial pigments can revolutionize various sectors, meeting consumer demand for natural, biodegradable colorants. This chapter emphasizes the importance of multidisciplinary research in driving the adoption of microbial pigments in sustainable industrial practices, promoting greener alternatives in global markets.

Link: https://doi.org/10.1079/9781836990505.0018

Published on February 2026

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