ALLIANCE UNIVERSITY
CENTRE for RESEARCH

DSIR RECOGNIZED SIRO
DEPARTMENT OF SCIENTIFIC & INDUSTRIAL RESEARCH GOVT. OF INDIA

ALLIANCE RESEARCH CHRONICLES

JANUARY 2026
Volume 1



ALLIANCE UNIVERSITY
CENTRE for RESEARCH

DSIR RECOGNIZED SIRO

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TABLE OF CONTENT

ABOUT ALLIANCE UNIVERSITY 8

ABOUT CENTRE FOR RESEARCH 9

PUBLICATION SUMMARY 12

A/ SCOPUS/WOS/JOURNALS

- FINITE—N SCALING, GELATION CUTOFF, AND MATCHED ASYMPTOTICS FOR SMOLUCHOWSKI COAGULATION EQUATION 16
- COMPARISON BETWEEN MULTI-SCALE DECOMPOSITION AND SPATIAL FREQUENCY BASED METHODS FOR THE INTEGRATION OF PANCHROMATIC AND MULTISPECTRAL PICTURES 17
- A COMPREHENSIVE REVIEW OF ROBOTICS AND DEEP LEARNING APPLICATIONS DURING THE COVID-19 PANDEMIC 18
- A STUDY OF VISCOELASTIC AND THERMAL PROPERTIES OF HABESHIAN BANANA FIBER-REINFORCED EPOXY COMPOSITES: THEORETICAL AND EXPERIMENTAL APPRAISAL 19
- A SELF-SUPERVISED HYBRID CNN WITH UNCERTAINTY-AWARE REFERRAL FOR DIABETIC RETINOPATHY SCREENING 20
- STREET VENDORS IN THE POST-COVID-19 ERA: A CONSERVATION OF RESOURCES THEORY PERSPECTIVE 21
- MELAMINE—FORMALDEHYDE SELF-HEALING MICROCAPSULES ADDED SISAL/HEMP/ABACA REINFORCED POLYMERIC COMPOSITES FOR MECHANICAL AND THERMAL EXPLORATIONS 22
- APPROACHES TO CONTACTLESS OPTICAL THERMOMETER EMPLOYING LANBO4:ER3+ SINGLE-CRYSTAL FIBERS 23
- ACCESSIBLE MULTILINGUAL AUDIO BASED IMAGE ALTERNATIVE (ALT) DESCRIPTION FOR THE PERSONS WITH VISUAL IMPAIRMENT 24
- TEMPERATURE-RESPONSIVE MIRNAS IDENTIFIED DURING IN VITRO GROWTH OF FUSARIUM OXYSPORUM F.SP. LYCOPERSICI CORRELATE WITH ALTERED VIRULENCE POTENTIAL IN PLANTA 25
- MEMBRANE MATERIALS FOR ELECTROMAGNETIC SHIELDING - MINI REVIEW 26
- THERMO-ECONOMIC AND ENVIRONMENTAL ASSESSMENT OF A SUSTAINABLE TRIGENERATION DOUBLE SLOPE SOLAR STILL INTEGRATED WITH A SINGLE-SIDE MOUNTED PHOTOVOLTAIC PANEL AND ELECTRICAL HEATING ELEMENT 27
- DISCOVERY OF NOVEL 1,3,4-THIADIAZOLE LINKED 1,2,4-OXADIAZOLE DERIVATIVES AS POTENT ANTICANCER AGENTS: SYNTHESIS, BIOLOGICAL EVALUATION, IN SILICO DOCKING AND DFT EXPLORATION 28
- SUSTAINABLE CARBON NANODOTS FROM MEDICINAL PLANTS: UNLOCKING THEIR BIOMEDICAL AND THERANOSTIC APPLICATIONS 29
- TARGETED DELIVERY OF THYMOQUINONE-ENCAPSULATED POLYETHYLENEIMINE/POLY (LACTIC ACID) NANOPARTICLES INTO BREAST CANCER CELLS 30
- CHARACTERIZATION OF NOVEL CELLULOSIC FIBER EXTRACTED FROM HIBISCUSENGLERI STEM FOR REINFORCEMENT IN POLYMER COMPOSITES 31
- TREE-BASED ENSEMBLE REGRESSION MODELS FOR EMISSION PREDICTION OF A WINTER GREEN OIL-HYDROGEN DUAL-FUEL ENGINE WITH ZEOLITE AFTER-TREATMENT 32
- MICROSTRUCTURAL REFINEMENT AND TRIBOLOGICAL RESPONSE OF CRYO-THERMAL TREATED INCOLOY 925 USING WEDM PROCESS 33
- INTELLIGENT FAULT DETECTION IN BATTERY SYSTEMS: A MACHINE LEARNING APPROACH WITH TRANSFORMER-ENHANCED MULTI-MODAL SENSING 34
- URBAN DATA FUSION FOR SPATIO-TEMPORAL INCIDENT FORECASTING USING GRAPH ATTENTION AND GENERATIVE AI 35
- A HYBRID NEURO-FUZZY OPTIMIZATION FRAMEWORK FOR SELF-HEALING AND LIFETIME ENHANCEMENT IN WIRELESS SENSOR NETWORKS 36

- THERMAL ANALYSIS OF INTEGRATING PHASE CHANGE MATERIAL AND EVAPORATIVE COOLING FOR THERMAL POWER RESERVES VIA ELECTRONIC COOLING 37
- ENHANCED ANTICANCER ACTIVITY OF NARINGENIN-ENCAPSULATED POLY (LACTIC ACID)/NEEM GUM NANOPARTICLES FOR BREAST CANCER CELLS 38
- DUAL ANTI-THERMAL QUENCHING IN PR3+-DOPED LITAO3 SINGLE-CRYSTAL FIBERS FOR HIGH-PERFORMANCE OPTICAL THERMOMETRY 39
- SYNTHESIS OF BIMETALLIC (FE/BI) OXYCHLORIDE NANOSHEET-ENTANGLED RODS (FBOCNR) FOR OSTEOSARCOMA NANO-THERAPY 40
- ECO-FRIENDLY SYNTHESIS AND CHARACTERIZATION OF COPPER NANOPARTICLES USING THALASSIA HEMPRICHII SEAGRASS: EVALUATION OF ANTIOXIDANT AND ANTIBACTERIAL ACTIVITIES 41
- A MULTIKINASE INHIBITOR AX-0085 BLOCKS FGFR1 ACTIVATION TO OVERCOMES OSIMERTINIB RESISTANCE IN NON-SMALL CELL LUNG CANCER 42
- LEAFAI: INTERPRETABLE PLANT DISEASE DETECTION FOR EDGE COMPUTING 43
- TOWARD SUSTAINABLE POLYMER COMPOSITES: SYNERGETIC EFFECTS OF SURFACE-TREATED MIMUSOPS ELENGI SEED SHELL POWDER ON POLYPROPYLENE PROPERTIES 44
- ETHICAL CONSUMPTION: VARIATIONS RELATED TO GENERATIONAL COHORTS AND GENDER AMONG CONSUMERS WITHIN EGYPT'S RESTAURANT INDUSTRY 45
- VALORIZATION OF AGRO-INDUSTRIAL RESIDUES FOR PLA-BASED BIOCOMPOSITES: ROLE OF MAPP COMPATIBILIZATION IN MECHANICAL AND THERMAL OPTIMIZATION 46
- GREEN SYNTHESIS AND CHARACTERIZATION OF PLA-BASED BIO-COMPOSITES REINFORCED WITH CELLULOSE FILLERS AND FIBERS 47
- SYNTHESIS OF WASTE-DERIVED TAMARINDUS INDICA FRUIT (WD-TIF)-BASED POLYPHENOL-ENCAPSULATED AG-NPS: A NEXT-GENERATION SUSTAINABLE ANTIBIOTIC MATERIAL 48
- A NOVEL GRAPH-EMBEDDED MUSICAL CHAIRS OPTIMIZATION WITH SECURE ELLIPTIC ENCRYPTION FRAMEWORK FOR INTELLIGENT EDGE COMPUTING IN HEALTHCARE IOT NETWORKS 49
- RADIO FREQUENCY AND MICROWAVE DIELECTRIC PROPERTIES OF PYROCHLORE CAMTINBO7 (M = BI, Y) CERAMICS 50
- STRUCTURAL AND THERMAL INTEGRITY OF KEVLAR FABRIC – CRUMB RUBBER SANDWICH POLYMER COMPOSITE 51
- CALCIUM DYNAMICS UNPLUGGED: NCLX IN DISEASE AND THERAPEUTIC FRONTIERS 52
- FERROELECTRIC HZO THIN FILMS FOR FEFETS: CRYSTAL STRUCTURE-DEVICE PERFORMANCE RELATIONSHIP 53
- CELLULOSIC SUNNHEMP FIBRES AND THEIR ROLE IN POLYMER COMPOSITES — A COMPREHENSIVE REVIEW 54
- A COMPREHENSIVE REVIEW ON HYDROPHOBICITY IN CELLULOSIC NATURAL FIBERS: TRENDS, TECHNIQUES, AND FUTURE DIRECTIONS 55
- RECENT ADVANCES IN MICROCRYSTALLINE CELLULOSE-REINFORCED POLYMER COMPOSITES: EXTRACTION, PROPERTIES, APPLICATIONS, AND SUSTAINABILITY PERSPECTIVES 56

B/ SCOPUS (CONFERENCE PAPERS, BOOK CHAPTERS, BOOKS AND EDITED BOOKS)

- DEVELOPMENTAL IDIOSYNCRATIC DEALS: A REVIEW OF PRESENT LITERATURE, RECENT TRENDS AND APPLICATIONS 58
- EMPOWERING CHANGE: THE ROLE OF DIVERSE WOMEN ENTREPRENEURS IN SHAPING AFRICA'S SUSTAINABLE FUTURE 59
- EDUCATION FOR SUSTAINABLE DEVELOPMENT AND PSYCHOLOGY OF SUSTAINABILITY: PATHWAYS TO EQUITY, RESILIENCE, AND INCLUSIVE GROWTH 60
- EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) AND GLOBAL CITIZENSHIP 61
- INVESTIGATING THE MAIN OBSTACLES FACED BY INDIAN WOMEN IN ACADEMIA WITH WORLDWIDE EXPERIENCE IN ORDER TO ADVANCE THE SDGS FOR GENDER EQUALITY AND DECENT WORK 62
- AI-DRIVEN CLOUD SHIELD: A COMPREHENSIVE REVIEW OF MACHINE LEARNING APPROACHES FOR

CLOUD CYBER SECURITY 63
- AI-POWERED PRIVACY SHIELDS AND MACHINE LEARNING APPROACHES FOR SECURING DIGITAL MONEY TRANSACTIONS: A SYSTEMATIC REVIEW 64
- CARTELS IN CRISIS MANAGEMENT: AN ANALYSIS OF THE US ANTITRUST LAW ON CRISIS CARTELS WITH SPECIAL REFERENCE TO THE COVID-19 PANDEMIC 65
- PURCHASE AND SALES OF LIFE INSURANCE SCHEMES: EVIDENCE FROM EAST INDIA 66
- ETHOS OF KNOWLEDGE CREATION CULTURE IN MANIFESTATION OF KNOWLEDGE REINFORCEMENT 67
- ROOT CAUSE ANALYSIS OF UNDERGROUND MINES ACCIDENT USING BAYESIAN NETWORK MODEL 68
- IMPLEMENTING STRIPS PLANNER FOR AUTOMATED TASK SCHEDULING 69
- A SOLUTION TO FUSCHIAN DIFFERENTIAL EQUATION HAVING FIVE SINGULAR POINTS 70
- OPIOID DISEASE MORTALITY RATE ANALYSIS IN UNITED STATES USING AI 71
- REAL-TIME ANOMALY DETECTION IN SMART ENERGY SYSTEMS USING STATISTICAL AND ADAPTIVE LEARNING TECHNIQUES 72
- USER DATA ANALYTICS FOR PREDICTION OF BUSINESS IMPACT DUE TO CYBERCRIMES IN INDIA: LEARNINGS FROM LITERATURE AND METADATA 73
- COMPREHENSIVE WEB SERVICE SECURITY AUDIT AND DATA CONCEALMENT USING ADVANCED VULNERABILITY DETECTION AND STEGANOGRAPHY TECHNIQUES 74
- TEMPORAL PATTERN RECOGNITION IN IOT SENSOR STREAMS USING SPATIO-TEMPORAL REASONING 75
- PRODUCT MARKET RESPONSE EVALUATION APPLYING USER DATA ANALYTICS: A STUDY ON BREAST FEEDING EQUIPMENT 76
- FUTURE OF MSMES IN THE DIGITAL AGE: CHALLENGES AND OPPORTUNITIES IN DEVELOPING COUNTRIES 77
- NOVEL ADAPTIVE TEMPORAL GRAPH LEARNING FRAMEWORK WITH EMBEDDINGS AND ATTENTION MECHANISMS FOR ENHANCED PREDICTIVE ACCURACY 78
- A FRAMEWORK FOR MENTAL HEALTH DETECTION IN TEENAGERS FROM ONLINE SOCIAL NETWORKS 79
- AN EFFICIENT ARTIFICIAL INTELLIGENCE BASED MODEL FOR TOURISM RECOMMENDATION 80
- OPTIMIZING PLANT DISEASE DETECTION WITH A NOVEL DEEP ENSEMBLE FRAMEWORK 81
- DATA-DRIVEN INSIGHTS FOR ENHANCING FINANCIAL WELL-BEING AMONG COLLEGE STUDENTS 82
- INTEGRATING EDGE-CLOUD COMPUTING AND IOT FOR REAL-TIME FOOD QUALITY ASSESSMENT 83
- CREATING A SUSTAINABLE FUTURE BY PREVENTING CUSTOMER CHURN IN E-COMMERCE - A COMPARISON OF MACHINE LEARNING MODELS 84
- MULTILINGUAL REAL-TIME SIGN LANGUAGE TRANSLATION: ENABLING CROSS-CULTURAL COMMUNICATION WITH AI 85
- REVOLUTIONIZING MICROGRID OPTIMIZATION: THE POWER OF META-HEURISTIC ALGORITHMS IN ADDRESSING OPERATIONAL CHALLENGES 86
- FUZZY-BASED CONTROL TECHNIQUES FOR VOLTAGE REGULATION IN DC MICROGRIDS WITH NONLINEAR LOAD DYNAMICS 87

C/ PATENTS

- AI AND MACHINE LEARNING-BASED PREDICTIVE SYSTEM FOR EARLY DETECTION, CLASSIFICATION, AND GROWTH PREDICTION OF CANCER CELLS USING BIOMEDICAL IMAGING 90
- WEAR-RESISTANT CO-CR-W-FE3AL-TA BASED HIGH-ENTROPY ALLOY COATING FOR HIGH-SPEED STEEL CUTTING TOOLS 91
- SUBSTITUTED OXADIAZOLE-THIADIAZOLE HYBRIDS FOR TREATMENT OF BREAST AND COLORECTAL CANCERS 91
- METHOD FOR CONTINUOUS MONITORING OF PARKINSONS SYMPTOMS USING INTEGRATED

WEARABLE SENSOR AND CLOUD ANALYTICS 92
· NATURAL BIOFIBER REINFORCED COMPOSITE PROSTHETIC SOCKET FOR TRANSTIBIAL AMPUTEES 92
· COGNITIVE ASSESSMENT AND EARLY DIAGNOSIS SYSTEM FOR ALZHEIMER'S DISEASE AND DEMENTIA USING MULTIMODAL ARTIFICIAL INTELLIGENCE 93

D/ DESIGN

· COGNITIVE AND LEARNING EDUCATION DEVICE 96
· AI BASED DEVICE FOR DETECTION OF CARDIAC DISEASES 97
· IOT-ENABLED LIVESTOCK TRACKER TAG 98
· WIRELESS FIELD MONITORING STATION 99
· IOT ENABLED REMOTE STRUCTURAL HEALTH MONITORING DEVICE 100

ABOUT ALLIANCE UNIVERSITY

Alliance reimagines the idea of the university by creating a community that leads the charge against the complex challenges of the 21st century. The university conceives research to be the essence of all teaching and learning practices. A unity between research and teaching is promoted to extend the frontiers of knowledge in order to solve real world problems at the local, national, and global scale. For this purpose, the university seeks to be the nerve centre of interaction between the industry, the government, the civil society, and the community at large.

In times when technological and social change is transforming the very idea of employability, the university embraces the increasing diversity of specializations while retaining the impulse to unify all knowledge.

A designed convergence of the business, engineering, law and liberal arts units precipitates transdisciplinarity as the core academic philosophy.

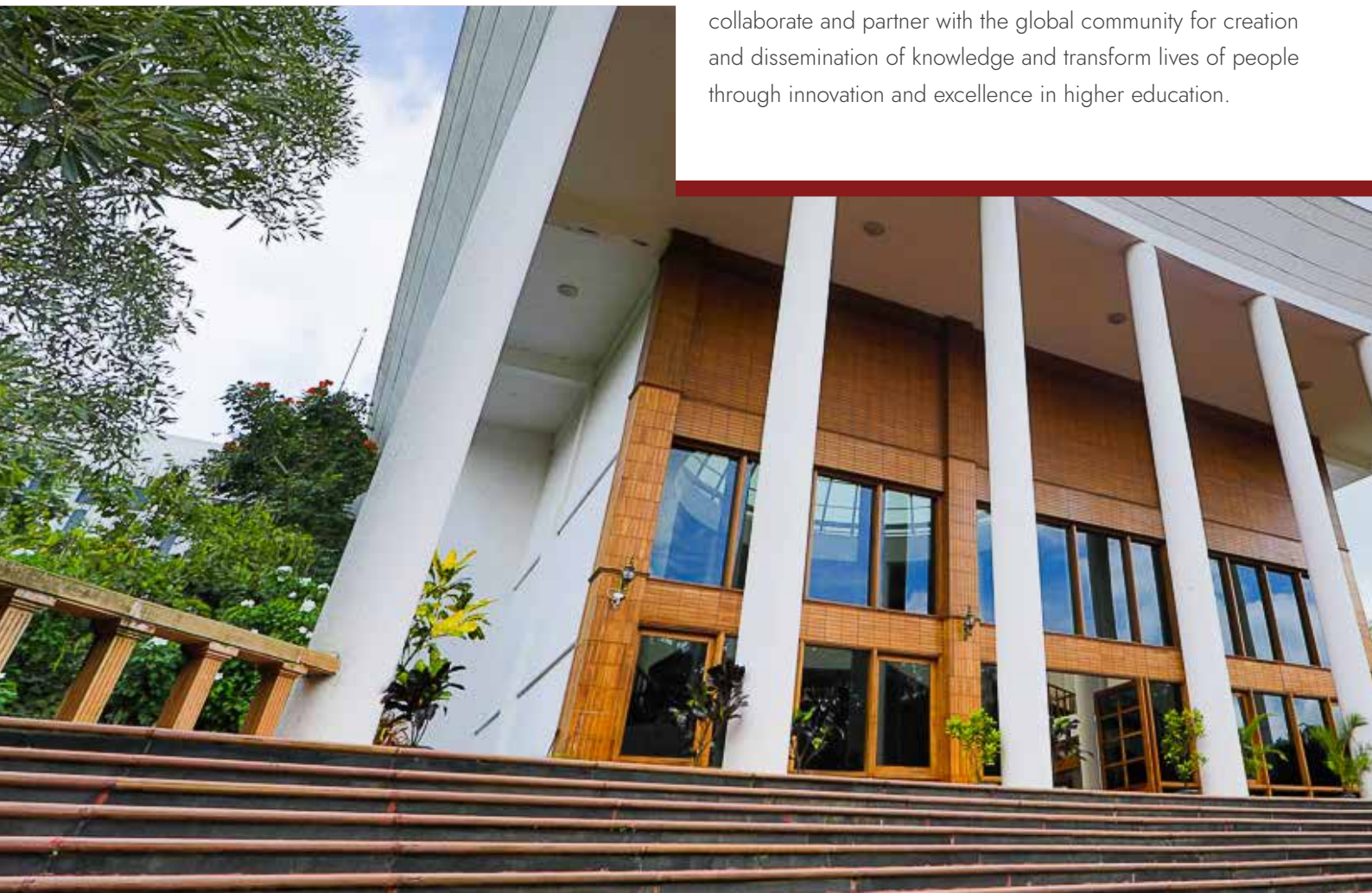
Freely working across divergent streams of knowledge like psychology and data science, technology and law, physics and philosophy or businesses and rhetoric, transdisciplinarity nurtures a dynamic foundation for the spirit of collaboration, inquiry, and enterprise.

VISION

Alliance University's vision is to be a world-class University that nurtures talent and catalytically transforms the lives of millions through excellence in teaching, research, service and community development. To uphold a commitment to shaping lives through scholarly teaching and learning, and that which contributes to an equitable and holistic transformation of society at large.

MISSION

The mission of the University is to create and sustain a community of lifelong learners in an environment that emphasizes literacy, critical thinking, and humanistic and scientific inquiry.
The University provides a dynamic, challenging and ethical environment for pursuing high quality teaching, research, learning and service across all areas of University, where students, faculty and other key constituents can interact, collaborate and partner with the global community for creation and dissemination of knowledge and transform lives of people through innovation and excellence in higher education.



ABOUT CENTRE *for* RESEARCH

The Centre for Research of Alliance University has been established to oversee the doctoral program and promote quality research through various Centres of Excellence (COEs) and publications.

The Centre for Research will be the nodal research center for Alliance University and will be committed to facilitating and promoting all academic research related activities. The Centre seeks to focus on providing a platform to Researchers and Academicians for thought provoking research on new and emerging fields and revolves around advancing knowledge and innovation within specific fields or interdisciplinary areas.

VISION

To pioneer transformative research initiatives that propel Alliance University to the forefront of global academia, driving innovation, societal advancement, and contributing to global progress and well-being.



MISSION

1. **Knowledge and Innovation:** Conduct cutting-edge research across disciplines to expand the frontiers of knowledge and drive innovation that addresses global challenges.
2. **Foster Collaborative Partnerships:** Cultivate partnerships with academic institutions, industries, and organizations worldwide to facilitate knowledge exchange, collaboration, and impactful research outcomes.
3. **Empower Research Scholars:** Provide a supportive environment, resources, and mentorship to empower researchers to pursue ambitious research agendas, develop critical skills, and become leaders in their fields.
4. **Address Global Challenges:** Tackle pressing global challenges such as climate change, healthcare disparities, food security, and technological advancement through interdisciplinary research that generates actionable solutions.
5. **Promote Societal Impact:** Translate research findings into real-world applications and policies that positively impact society, foster sustainable development, and contribute to the betterment of humanity and the planet.

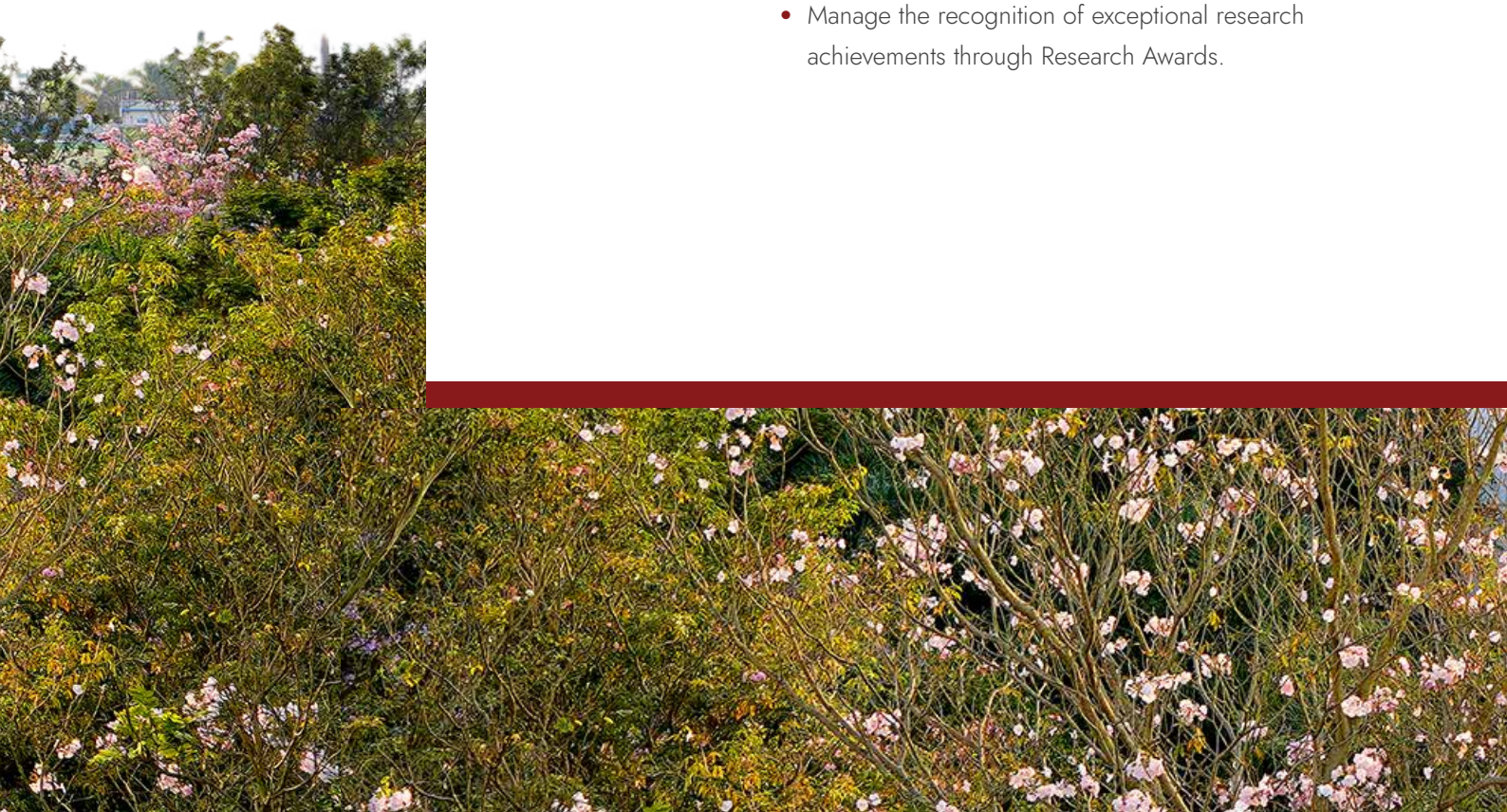
ABOUT CENTRE *for* RESEARCH (Contd.)

CORE VALUES

- **Collaboration:** Foster a culture of collaboration, inclusivity, and openness, recognizing the value of interdisciplinary teamwork and partnerships in addressing complex global challenges.
- **Innovation:** Embrace creativity, curiosity, and innovation, encouraging bold and unconventional approaches to research that lead to breakthrough discoveries and advancements.
- **Integrity:** Uphold the highest ethical standards in all research activities, demonstrating honesty, transparency, and accountability in the conduct and dissemination of research.
- **Agility:** Embrace agility and adaptability in response to evolving research landscapes and emerging challenges, fostering a culture of flexibility, innovation, and continuous improvement.
- **Diversity and Inclusion:** Value and celebrate diversity in perspectives, backgrounds, and experiences, fostering an inclusive research environment where all voices are heard, respected, and valued for their contributions.

OBJECTIVES

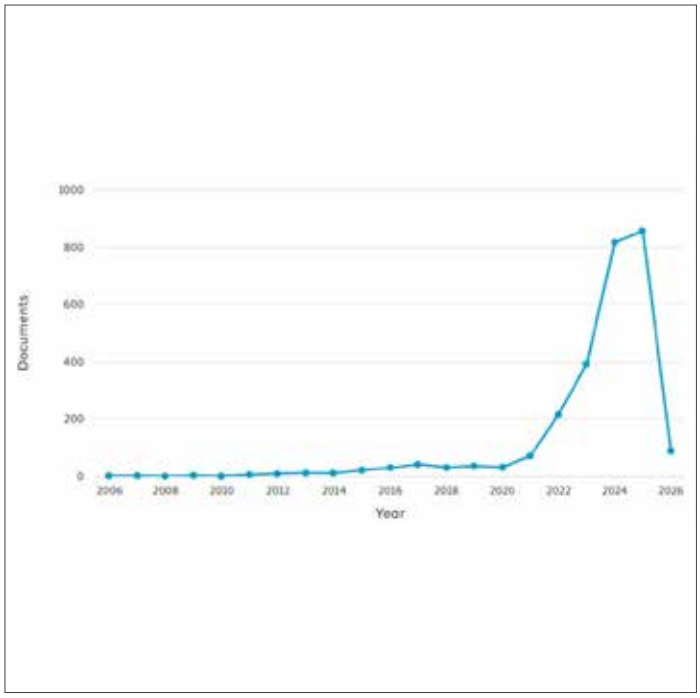
- Support the Ph.D. Admission process and facilitate the Ph.D. Program across all academic units of Alliance University.
- Providing resources and support for faculty, students, and visiting/full-time scholars engaged in research activities.
- Contributing to the advancement of knowledge through publications, presentations, and other forms of dissemination.
- Fostering collaboration among researchers within and outside the institution.
- Conducting cutting-edge research in specific fields or interdisciplinary areas.
- Addressing societal challenges and promoting solutions through research and innovation.
- Enhancing the reputation and impact of the institution through high-quality research outputs.
- Supporting the professional development of researchers and students through training, mentorship, and networking opportunities.
- Serving as a hub for intellectual exchange, seminars, workshops, and conferences to promote interdisciplinary collaboration and knowledge sharing.
- To oversee the working of Academic Integrity bodies which includes the Department Academic Integrity Panel (DAIP) and Institution Academic Integrity Panel (IAIP).
- Manage the recognition of exceptional research achievements through Research Awards.



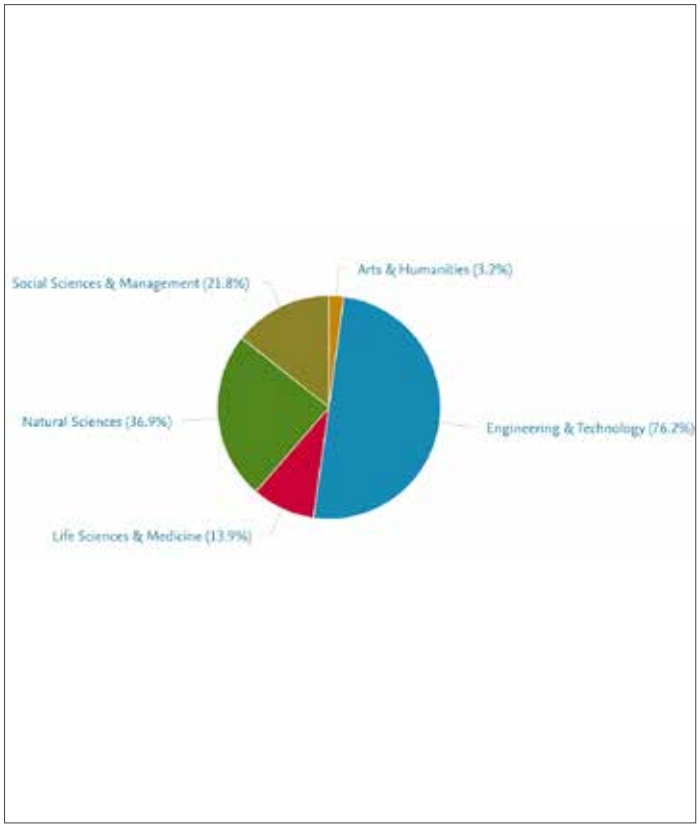


2708	1167
Documents	Authors

Documents by Year



Documents by Subject Area

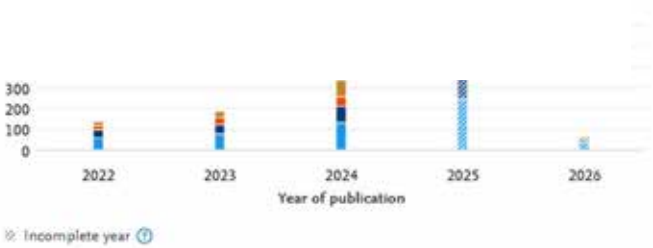


Summary

2708	1167	12312	4.5	1.62	49
Scholarly Output	Authors	Citation Count	Citations per Publication	Field-Weighted Citation Impact	H-index

Note: Scholarly output, Authors and Citation Count are Taken from SCOPUS, and other Metrics are taken from SCIVAL.

Publication by Journal Quartile



Quartiles	Publications	Publication share (%)
Q1 (top 25%)	553	43.3
Q2 (26% - 50%)	314	24.6
Q3 (51% - 75%)	168	13.2
Q4 (76% - 100%)	242	19.0

Cumulative shares	Publications	Publication share (%)
Q1 to Q2 (top 50%)	867	67.9
Q1 to Q3 (top 75%)	1,035	81.0

Geographical Collaboration Overall

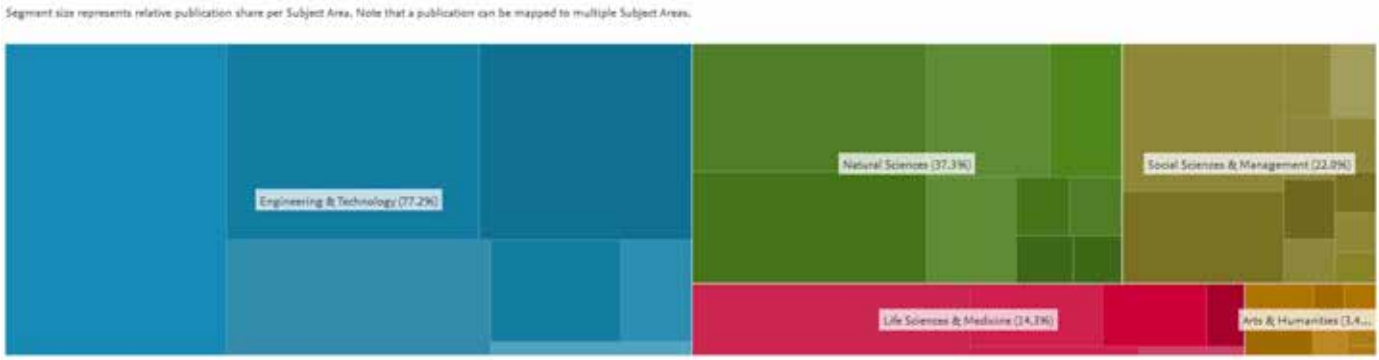


Metric	Publication share	Scholarly Output	Citations	Citations per Publication	Field-Weighted Citation Impact
International collaboration	31.9%	748	5,672	7.6	1.88
Only national collaboration	48.0%	1,128	3,852	3.4	1.88
Only institutional collaboration	14.7%	346	394	1.1	0.77
Single authorship (no collaboration)	5.4%	126	139	1.1	0.44

Publication by SDG



Publication by Subject Areas



* The Publication metrices and the author affiliations are taken from SCOPUS/SciVal as on 15/2/2026


NON SOLUS
Scopus
JOURNALS


Clarivate™
Web of Science

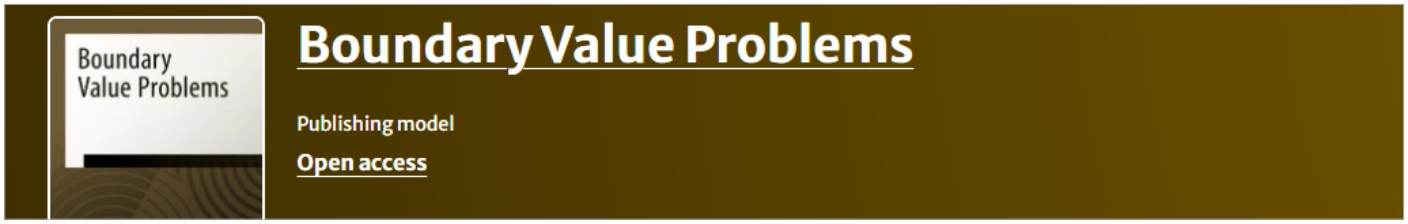
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**75th**	**1.7**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

FINITE–N SCALING, GELATION CUTOFF, AND MATCHED ASYMPTOTICS FOR SMOLUCHOWSKI COAGULATION EQUATION

Kumar, V.; Mondal, S.R.

Boundary Value Problems

Dr. Varun Kumar
Professor
Department of Pure and Applied Mathematics
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Abstract

We develop a finite-N matched-asymptotic theory for Smoluchowski coagulation. Starting from the infinite system of ODEs, we use conservation laws to obtain closed scalar evolution equations for suitable moments. For the constant kernel aj,k=K, this leads to an exact early-time decay law for the cluster number and the linear coalescence-time scaling TN≃N when the volume scales as V~N. For the sum kernel aj,k=j+k, the same reduction yields an exponential decay regime for the number of clusters and a logarithmic finite-N coalescence time. For the multiplicative kernel aj,k=jk, we recover the classical finite-time blowup of the second moment and show that finite N produces a sharp gelation cutoff preceding the mean-field gelation time by a window of order N−2. In all kernels considered, the late-time dynamics involve only finitely many clusters and contribute only lower-order corrections. The resulting structure closely parallels that of finite-N two-species annihilation: a conserved quantity reduces the dynamics to a scalar ODE, asymptotic matching at a characteristic time yields the finite-size scaling laws, and post-matching effects do not alter the leading behaviour. © The Author(s) 2026.

Author keywords- Coalescence time scaling; Finite- N scaling; Gelation phenomenon; Matched asymptotics; Smoluchowski coagulation equation

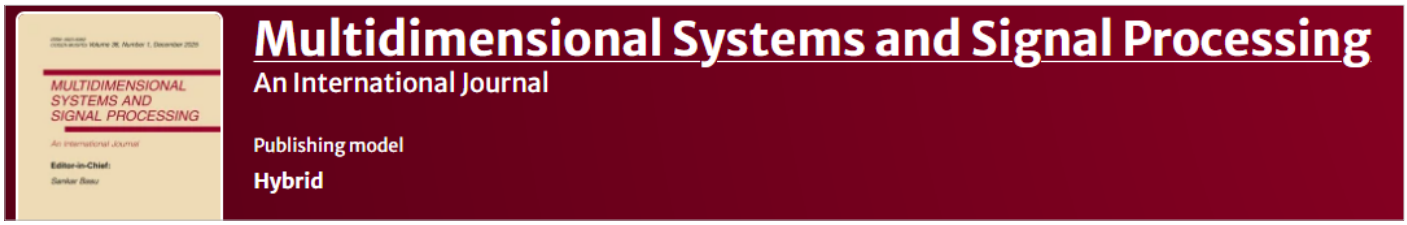
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	83rd	2.92	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 11 SUSTAINABLE CITIES AND COMMUNITIES

COMPARISON BETWEEN MULTI-SCALE DECOMPOSITION AND SPATIAL FREQUENCY BASED METHODS FOR THE INTEGRATION OF PANCHROMATIC AND MULTISPECTRAL PICTURES

Kumar, G.; Rajput, U.K.; Saini, R.K.

Multidimensional Systems and Signal Processing

Dr. Gaurav Kumar
Associate Professor
Electronics and Communication Engineering
Alliance School of Applied Engineering



Abstract

A technique for merging a high-resolution PAN image with a low-resolution multispectral image from LISS-III and World View-2 is suggested in this paper. The spatial-frequency technique, in particular the pseudo-Wigner distribution (PWD), offers pixel-by-pixel analysis, shift invariance, and characterization of local spectral features of nonstationary images. The suggested approach is compared with multi-scale decomposition techniques like NSCT and SWT. Using root mean square error (RMSE), peak signal to noise ratio (PSNR), correlation coefficient (CC), relative dimensionless global error (ERGAS), and RASE, the performance of the suggested technique, the non-subsampled contour-let transform, and the stationary wavelet transform (SWT), is compared. Based on thorough tests using the LISS-III and World View-2 datasets, it is observed that the suggested method is statistically and visually more effective than traditional picture fusion algorithms. The suggested approach enhances spatial resolution while retaining spectral data.
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Author keywords- Contour-let transform; Image fusion; Non-sub-sampled; Pseudo wigner distribution; Shift-Invariant; Spatial-frequency analysis

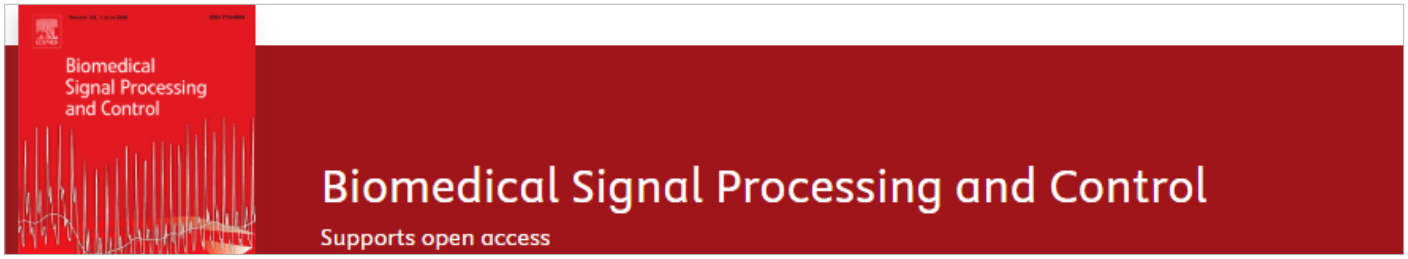
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**91St**	**4.9**	03 GOOD HEALTH AND WELL-BEING; 09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

A COMPREHENSIVE REVIEW OF ROBOTICS AND DEEP LEARNING APPLICATIONS DURING THE COVID-19 PANDEMIC

Rooban, S.; **Thanakumar Joseph S, Iwin.**; Ahamed Ayoobkhan, M.U.; Kattiakara Muni Samy, M.R.

Biomedical Signal Processing and Control

Dr. Iwin Thanakumar Joseph
Professor
Computer Science and Engineering
Alliance School of Advanced Computing



Abstract

The people are impacted by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus pandemic in worldwide over last two years, commonly known as coronavirus disease (COVID 19). In an effort to stop outbreak, governments of numerous nations have implemented measures like social distance and full or partial lockdowns. There is less interaction between people as a result of these COVID-19 preventive and control measures. It reviews the contribution of robotics, enhanced with deep learning techniques, to the challenges set during the COVID-19 pandemic. Attention is placed mainly on robotic applications for diagnosis, monitoring, disinfection, patient assistance, and rehabilitation; IoT and blockchain technologies are considered only when they directly support a robotic function. Existing research is analyzed in a structured manner to identify the performance, capabilities, and limitations of different robotic models and deep learning techniques. Comparisons among the different approaches are also made to provide a better understanding of the current trends and future directions. The findings point out that integration of robotics with deep learning enhances safety, efficiency, and healthcare support in pandemic conditions.
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Author keywords- Block chain; COVID 19; Deep Learning; Pandemic; Robotics; SARS-CoV-2 virus

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	66th	3.83	12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 13 CLIMATE ACTION

A STUDY OF VISCOELASTIC AND THERMAL PROPERTIES OF HABESHIAN BANANA FIBER-REINFORCED EPOXY COMPOSITES: THEORETICAL AND EXPERIMENTAL APPRAISAL

Venkatesh, C.; Shahapurkar, K.; Kanaginahal, G.; Mohanavel, V.; Kannan, S.; Tirth, V.; Algahtani, A.; Arunachalam, K.P.; Soudagar, M.E.M.; Sankar, T.

Polymer Bulletin

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Abstract

Recent awareness of sustainable environments and the recycling of biowaste materials has stimulated various industrial sectors to replace conventional materials with polymer composites for processing their products. This study aims to reinforce the aspiration of such industries to be more focused on bio-polymers. Banana fiber was utilized to reinforce the epoxy composite in two different variants: untreated and chemically treated. Furthermore, fiber variants were followed as short fibers, woven mat, and woven mat-short fibers hybrid. To estimate the viscoelastic properties, dynamic mechanical analysis (DMA) and post-fracture analysis were carried out. Additionally, the possible strengthening mechanism and thermal stability of the bio-polymers were evaluated with exclusive theoretical modelling to justify the improvement in the viscoelastic nature of the materials. The results concluded that the generous improvement of 100%, 141%, and 150% in storage, loss modulus and damping behaviour of treated woven banana (T-WBF) compared to untreated short banana fiber (UT-SBF). The increased level of interphase shear strength parameter and activation energy evolved from theoretical modeling demonstrated the higher structural and thermal stability of treated woven banana fiber, respectively, indicating that the novel biopolymer is the ideal candidate for structural and automotive applications.
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Author keywords- Adhesion factor; Banana fiber; Damping; Interphase shear strength; Storage modulus; Woven mat

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**91st**	**4.9**	03 GOOD HEALTH AND WELL-BEING

A SELF-SUPERVISED HYBRID CNN WITH UNCERTAINTY-AWARE REFERRAL FOR DIABETIC RETINOPATHY SCREENING

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Biomedical Signal Processing and Control

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Abstract

Diabetic retinopathy (DR) is a leading cause of vision loss, making accurate, early screening essential. We present a lightweight, self-supervised hybrid CNN for automated DR detection from retinal fundus images that fuses MobileNet and EfficientNet with a residual attention mechanism for multi-scale, DR-specific feature extraction, and combines predictions in an ensemble with ResNet for robustness. The training pipeline includes a two-stage self-supervised warm start (general EyePACS pretraining followed by domain-specific refinement), a binary-to-five-class curriculum schedule to stabilize optimization, Grad-CAM for visual interpretability, and an uncertainty-aware referral module based on Monte Carlo Dropout. Evaluated on public (APTOS, Messidor) and private datasets under stratified 5-fold cross-validation with strict patient-level separation and external held-out testing on an independent private dataset, the framework achieves state-of-the-art performance with a macro F1-score of 98.1% and an AUC of 99.2% (mean across test folds), representing a 2.1 percentage-point gain over an ImageNet-initialized baseline. The uncertainty module flags 75% of misclassified cases for expert review, while a fairness audit stratified by image quality shows stable performance with a worst-case AUC drop of only 1.2 percentage points. Inference is efficient (approximately 45 ms on a consumer GPU for the full ensemble and approximately 180 ms on a mobile-class CPU for a single forward pass of the hybrid backbone), supporting deployment from clinic to edge. These results indicate that a self-supervised hybrid CNN with explainability and uncertainty-aware referral can deliver accurate, reliable, and equitable DR screening with promising potential for real-world clinical workflows. © 2026 Elsevier Ltd

Author keywords- Computer-aided diagnosis; Convolutional neural networks; Curriculum learning; Deep learning; Diabetic retinopathy; Ensemble learning; Explainable AI; Fairness audit; Fundus images; Hybrid architecture; Residual attention mechanism; Self-supervised learning; Uncertainty quantification

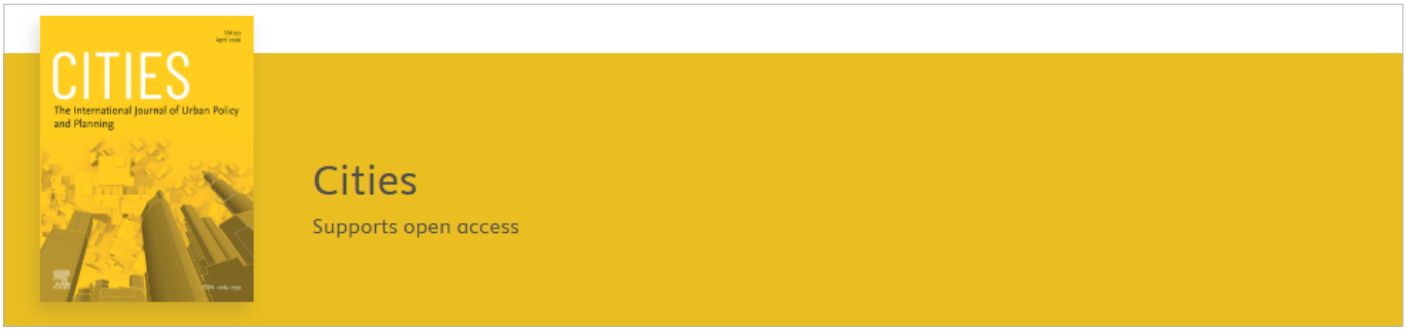
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	97th	6.6	08 DECENT WORK AND ECONOMIC GROWTH; 11 SUSTAINABLE CITIES AND COMMUNITIES

STREET VENDORS IN THE POST-COVID-19 ERA: A CONSERVATION OF RESOURCES THEORY PERSPECTIVE

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Cities

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Abstract

Street vendors sell goods or services in public spaces, playing a significant role in urban economies by providing convenient products to consumers. This paper focuses on the socio-economic, working conditions, psychological, and official support for street vendors after the pandemic through the lens of the Conservation of Resources (COR) theory. The paper analyses the responses from 302 street vendors in selected residential and commercial places in Bangalore, India. For doing business confidently, proper working conditions and official support are significant compared to social, economic, psychological, and family functioning aspects is confirmed through this study. From the analysis, the confidence to do street vending is possible through the support from officials and good working conditions that contribute to street vendors' psychological well-being. Hence, as per the COR theory, official support and adequate working conditions inhibit further resource depletion and stimulate resource gain phases, improving psychological well-being.
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Author keywords- Economic condition; Official support; Pandemic; Psychological well-being; Social; Street vendors; Working condition

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	**66th**	**3.83**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

MELAMINE–FORMALDEHYDE SELF-HEALING MICROCAPSULES ADDED SISAL/HEMP/ABACA REINFORCED POLYMERIC COMPOSITES FOR MECHANICAL AND THERMAL EXPLORATIONS

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Polymer Bulletin

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Abstract

Present research focused on the formation and effect of melamine–formaldehyde self-healing microcapsules on the mechanical performance of sisal, hemp and abaca reinforced epoxy composites. Self-healing microcapsules were formed by combining 3.12 g of melamine–formaldehyde and 0.75 g of copolymer in deionized water, followed by mixing the solution with bafflers inside a cylindrical vessel. In mechanical tests, Sisal/Epoxy/Self-healing Microcapsules (SESM) composite demonstrates the highest elongation at break of 9.21% while Abaca/Epoxy/Self-healing Microcapsules composite exhibits the highest young's modulus of 916.4 MPa. Tensile strength of SESM composite leads with a maximum value of 79.56 MPa. The highest value of flexural strength, flexural modulus and hardness was observed in the Sisal/Epoxy/Healing Agent (SESM) composite at 75.37 MPa, 2.96 GPa and 97 Shore-D. Hemp/Epoxy/Self-healing Microcapsules (HESM) composite exhibits the highest impact strength at 22.3 kJ/m2. The highest surface roughness of 0.58 µm was observed in the SESM composite. The Sisal/Self-healing Microcapsules composite exhibited the highest fatigue resistance, withstanding 3312 cycles, followed closely by HESM (3167 cycles) and SE (3017 cycles) while SESM composite displayed the lowest creep strain across all time points, beginning at 0.022 (2000s) and reaching only 0.309 (15,000 s). SESM composite exhibited the highest thermal conductivity at 27.65 W·m 1·K 1.
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Author keywords- Hemp; Melamine–formaldehyde; Sisal

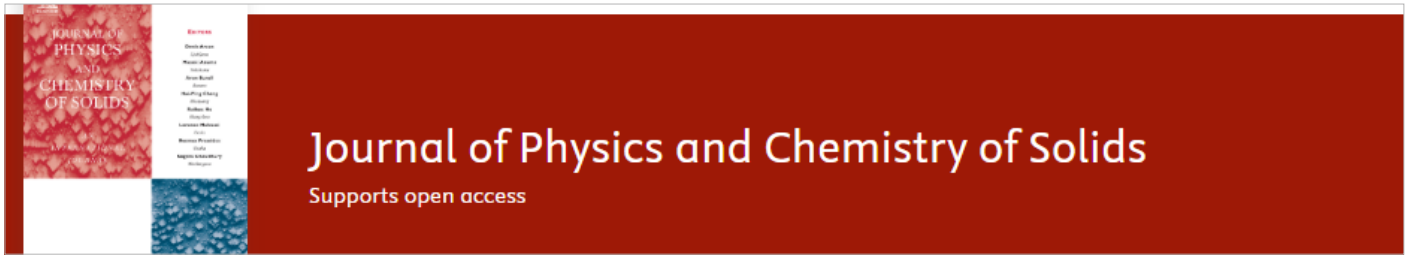
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	89th	4.9	03 GOOD HEALTH AND WELL-BEING; 09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

APPROACHES TO CONTACTLESS OPTICAL THERMOMETER EMPLOYING LANBO4:ER3+ SINGLE-CRYSTAL FIBERS

Do Nascimento, J.P.C.; do Carmo, F.F.; Nogueira, F.E.A.; da Silva, M.A.S.; **Sandhu, C.**; da Silva, R.S.; Ripardo de Alexandria, A.R.; Sombra, A.S.B.

Journal of Physics and Chemistry of Solids

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Abstract

Er3+-doped LaNbO single-crystal fibers (SCFs) were obtained through the method laser-heated pedestal growth (LHPG) technique and their applications in thermometry were evaluated employing different approaches. X-ray diffraction demonstrated that all the analyzed fibers maintained the LaNbO host structure. Upconversion luminescence properties of the SCFs were investigated using excitation at 808 nm, revealing green and red emissions originating from Er3+ ions. To evaluate the optical thermometry performance, five temperature-sensing strategies were employed based on: thermal coupling level (TCL); non-thermally coupled level (NTCL); spectral position of the 2H11/2 emission band; linewidth broadening of emission band; and valley-to-peak ratio ratio (VPR) method. The obtained sensitivity values demonstrated that Er3+-doped LaNbO4 SCFs would be interesting candidates for applications in thermometry. Among the methods employed in this work, the greatest sensitivity was observed for the linewidth-broadening of emission band method, which presented a relative sensitivity of 4.95 % K–1 at 303 K. © 2025 Elsevier Ltd

Author keywords- Fluorescence intensity ratio (FIR); Optical temperature sensing; Single-crystal fibers

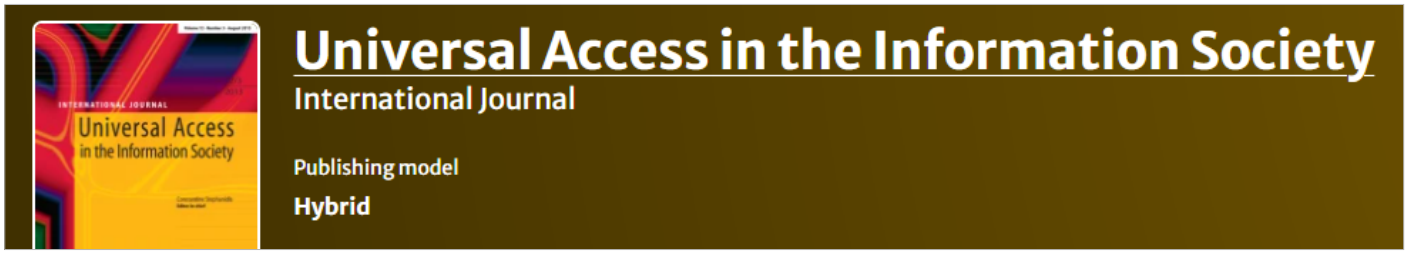
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	**50th**	**2.7**	04 QUALITY EDUCATION, 10 REDUCED INEQUALITIES

ACCESSIBLE MULTILINGUAL AUDIO BASED IMAGE ALTERNATIVE (ALT) DESCRIPTION FOR THE PERSONS WITH VISUAL IMPAIRMENT

Balaji, V.; Sonowal, G.; Veerachamy, V.; **Rangasamy, R.**

Universal Access in the Information Society

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Abstract

Audio Description (AD) is a vital tool for enhancing web accessibility, particularly for individuals who are visually impaired or blind. However, a significant challenge in the multilingual information retrieval domain is the real-time translation of alternative text (ALT) for images, which often fails to provide comprehensive descriptions. Existing systems typically offer brief ALT text, omitting critical visual details such as facial expressions, body language, and contextual backgrounds. This limitation hinders the ability of visually impaired users to fully understand and engage with visual content on multilingual websites. To address this issue, this paper proposes an Accessible Multilingual Audio-based Image Alternative (ALT) Description Model, designed to deliver real-time, detailed, and barrier-free image descriptions for visually impaired users. The models performance was validated through testing with 20 visually impaired participants, demonstrating its effectiveness in enhancing accessibility and inclusivity. Using the Jaro–Winkler string measuring algorithm, the similarity of ALT text across different language versions was evaluated. The analysis revealed that 75% of ALT texts remained unchanged during real-time web translation, highlighting the inadequacy of current systems in providing accurate and detailed descriptions. By addressing the limitations of existing approaches, this study contributes to the development of more accessible multilingual web environments, ensuring that individuals with disabilities can fully engage with digital content. The proposed model aligns with global accessibility standards and supports efforts to create a more inclusive digital landscape. © The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2026.

Author keywords- ALT text accessibility; Audio description; Jaro–Winkler algorithm; Multilingual web; Persons with disabilities (PwD's)

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	**55th**	**3.3**	02 ZERO HUNGER, 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

TEMPERATURE-RESPONSIVE MIRNAS IDENTIFIED DURING IN VITRO GROWTH OF FUSARIUM OXYSPORUM F.SP. LYCOPERSICI CORRELATE WITH ALTERED VIRULENCE POTENTIAL IN PLANTA

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Physiological and Molecular Plant Pathology

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Abstract

Fusarium oxysporum f.sp. lycopersici (Fol), a soil-borne fungal pathogen, causes Fusarium wilt in tomato, leading to substantial crop losses worldwide. While microRNAs (miRNAs) are well-characterized in plants and animals, their functional roles in fungi, especially under environmental stress, remain largely unexplored. This study aimed to identify temperature-responsive Fol miRNAs during its in vitro growth and to examine their potential correlation with pathogen virulence. The Fol cultures incubated at 20 °C and 28 °C exhibited differential mycelial growth, sporulation, and pathogenicity, with higher aggressiveness observed at 28 °C. Small RNA sequencing revealed 15 novel miRNAs, among which five and six miRNAs were exclusively expressed at 20 °C and 28 °C, respectively, while four were common to both conditions. Stem-loop RT-PCR confirmed the temperature-dependent expression of the selected miRNAs. The miRNA secondary structure analysis revealed that the 21-bp mature miRNA sequences were located in either the stem or loop regions of the precursor molecules. Predicted target genes of the identified miRNAs with strong miRNA-binding affinity were tested for transcript cleavage using modified 5′ RNA Ligase-Mediated-Rapid Amplification of cDNA Ends (RLM-RACE), which validated Fol-miR-S13-mediated cleavage of two Fol transcripts, KNA98265 and KNB04665. Other predicted targets showed no cleavage, suggesting translational repression mechanisms. Gene ontology analysis revealed that the miRNAs modulated pathways related to fungal growth, virulence, metabolism, and transcriptional regulation. The findings of this study provide insights that may contribute to the development of miRNA-based approaches for managing fungal diseases, including potential biomarkers of environmental responsiveness and prospective targets for RNAi-mediated crop protection. © 2025 Elsevier Ltd.

Author keywords- Fungal microRNAs; Fungal virulence; RNA interference; Thermoregulation; Tomato wilt

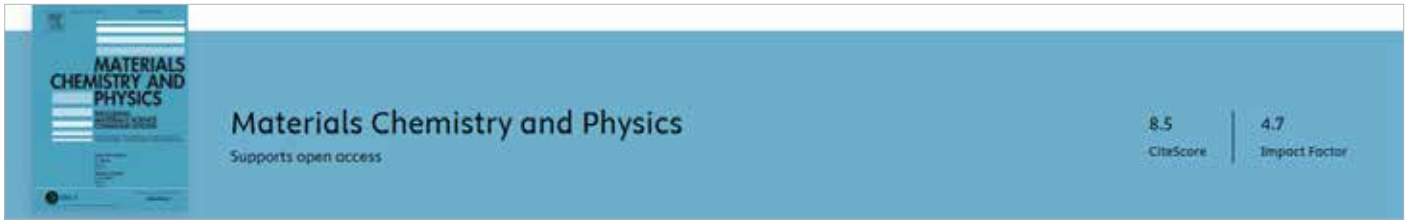
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**88th**	**4.7**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

MEMBRANE MATERIALS FOR ELECTROMAGNETIC SHIELDING - MINI REVIEW

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Materials Chemistry and Physics

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Abstract

Membranes/polymeric materials are gaining more attention as being solutions to many globalchallenges. In this mini review we attempt to draw the attention of membranes/thin films, coatings, and layered composites as effective material for shielding of harmful electromagnetic radiation through mechanisms such as absorption, reflection, multiple reflection, and magnetic and dielectric losses. This article mainly focusses on thin films, coatings, and layered structure types (metal/alloy based, MXenes based, carbon based, ICP) and structure (porous and layered, foam, segregated) which contributes to electromagnetic shielding. Number of studies suggested that segregated network and intercalated framework of cellular foam give effective shielding efficiency in X band. With the rise of 6G technology operating at frequencies beyond 100 GHz, investigators face significant tasks in developing materials that can effectively counter the growing threats of electromagnetic interference emphasizing on material design strategies such as polymer-based conductive networks, MXene-integrated architectures, and porous or layered configurations that enhance absorption and reflection performance through synergistic magnetic and dielectric interactions. Unlike earlier reviews that focus on single material classes, this work integrates structural design perspectives with functional mechanisms to identify trends shaping next-generation shielding materials. Traditional shielding materials may not be sufficient at these ultra-high frequencies, necessitating the design of next-generation membranes with custom-made electrical, structural, and dielectric properties. Concisely this mini review highlights recent progress in thin films, coatings, and layered composites as lightweight, flexible, and multifunctional alternatives to traditional shields.
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Author keywords- electromagnetic shielding; Membrane structure; Membrane types; Membranes; Research gaps

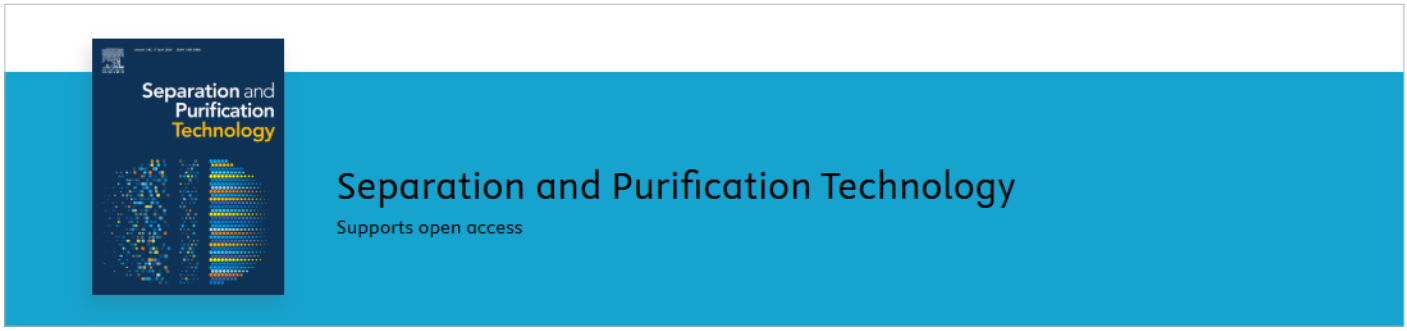
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	95th	9.0	06 CLEAN WATER AND SANITATION; 07 AFFORDABLE AND CLEAN ENERGY; 13 CLIMATE ACTION

THERMO-ECONOMIC AND ENVIRONMENTAL ASSESSMENT OF A SUSTAINABLE TRIGENERATION DOUBLE SLOPE SOLAR STILL INTEGRATED WITH A SINGLE-SIDE MOUNTED PHOTOVOLTAIC PANEL AND ELECTRICAL HEATING ELEMENT

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Separation and Purification Technology

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Abstract

The traditional double-slope solar still (DSS) integrated with a solar photovoltaic (PV) panel usually needs larger space, components, and maintenance to function optimally. To address these limitations, this study introduces a modified double-slope solar still (MDSS), in which the solar PV panel is directly mounted on top of the DSS. This compact configuration enables trigeneration of electricity, heat energy, and freshwater thereby enhancing the system long-term operational efficiency. Although solar PV panel placement caused partial shading, this effect is offset by a solar-powered electric heating element to preheat the inlet saline water. The experimental results demonstrated that the MDSS surpassed the DSS, achieving improvements of 71.4 % in cumulative productivity, 39 % in energy efficiency, and 41.9 % in exergy efficiency. Furthermore, the solar PV panel in the MDSS achieved the maximum power output of 46.3 W, with electrical, thermal, heating element, combined energy, and combined exergy efficiencies of 13.5 %, 35.5 %, 87.8 %, 51.4 %, and 5.8 %, respectively. Additionally, the MDSS achieved an 11.1 % lower cost per liter (CPL) of distillate and a 10.1 % shorter payback period (PBP) than DSS. It also demonstrated a 75.7 % higher CO_2 mitigation potential than DSS. Moreover, the MDSS showed a 3 % higher sustainability index than DSS by indicating better long-term efficiency. Distillate analysis confirmed that both MDSS and DSS produced water meeting required drinking standards. Finally, these findings confirm that the MDSS offers a more effective and sustainable solution for triple generation of potable water, heat energy and electricity compared to the DSS.
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Author keywords- Double slope solar still; Economic; Electrical heating element; Environmental; Productivity; Solar photovoltaic panel; Thermodynamic

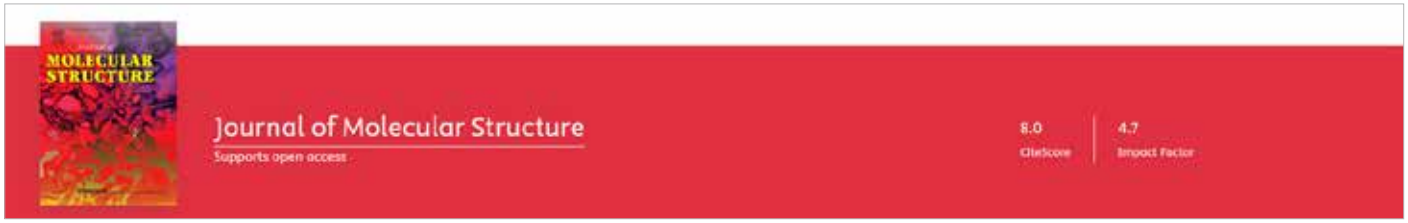
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**84th**	**4.7**	03 GOOD HEALTH AND WELL-BEING

DISCOVERY OF NOVEL 1,3,4-THIADIAZOLE LINKED 1,2,4-OXADIAZOLE DERIVATIVES AS POTENT ANTICANCER AGENTS: SYNTHESIS, BIOLOGICAL EVALUATION, IN SILICO DOCKING AND DFT EXPLORATION

Pala, R.; **Pathak, C.**; Garai, S.; Nalamada, K.; Ullapu, P.R.; Kasa, S.; Allaka, T.R.

Journal of Molecular Structure

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Abstract

The search for novel potent anticancer agents is considered a rapidly advancing field and viewed as a constantly evolving area within medicinal chemistry. In this study, a series of novel 1,2,4-oxadiazole-bearing 1,3,4-thiadiazole analogues (6a-6l) were designed, synthesized, and evaluated for their anticancer properties. All synthesized 1,3,4-thiadiazoles (6a–6l) were characterized by various spectroscopic methods (1H/13CNMR, FT-IR, and HRMS spectrometry). These compounds were tested for their in vitro cytotoxicity against MDA-MB-231, MCF-7, HCT116, and Caco-2 cell lines. Compounds 6b, 6e, 6g and 6j showed potent activity against all the tested cell lines. Compound 6b was the most potent one and showed activity against MDA-MB-231 and HCT116 cell lines, with IC 50 (μg/mL) values of 5.70 ± 0.6 and 5.01 ± 2.5, respectively, compared to doxorubicin, with IC 50 (μg/mL) values of 4.25 ± 0.7 and 5.15 ± 1.4, respectively. Binding mode analysis of ligand 6g revealed a favorable H-bonding interaction within the active pocket of the breast cancer target [7UJY], involving key amino acids AspB:473, ArgB:477, and AspC:411. DFT analyses elucidated electronic properties, including E HOMO E LUMO (4.68–4.89 eV) and electrophilicity indices (2.90–4.52 eV), correlating with observed bioactivity. The theoretical predictions by DFT and in silico docking analysis of physico-chemical and ADME/Tox properties were well supported by the experimental studies, and anticancer assays revealed strong activity, indicating the potential candidates for the future bioactive scaffolds. © 2025 Elsevier B.V.

Author keywords- 1,2,4-oxadiazole; 1,3,4-thiadiazole; Anticancer; DFT theory; Docking study; ProTox-II

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**92nd**	**6.2**	06 CLEAN WATER AND SANITATION; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

SUSTAINABLE CARBON NANODOTS FROM MEDICINAL PLANTS: UNLOCKING THEIR BIOMEDICAL AND THERANOSTIC APPLICATIONS

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Industrial Crops and Products

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Abstract

Carbon nanodots (CDs) derived from medicinal plants are gaining more importance because of their distinct properties, environmental friendliness, and prospective biological and theranostic uses. Due to their low toxicity, nanoscale dimensions, biocompatibility, tunable optical characteristics, and ease of surface functionalization, they are promising candidates for drug delivery, bioimaging, theranostics, and targeted detection of cancerous cells and their organelles, such as the nucleus and mitochondria. CDs derived from medicinal plant sources including fruits, leaves, bark, stems, flowers, seeds, and bioactive substances, have been synthesized through various methods to tailor their size and properties. Further, the physicochemical and biological properties of the CDs are also enhanced by novel methods of synthesis. The plant derived CDs have many advantages including low production costs, high selectivity and sensitivity, as well as their superior photoluminescence characteristics, making them highly suitable for diverse biomedical applications. Plant-derived CDs offer diverse therapeutic value, including anticancer, neurological, cardiovascular, and antidiabetic applications. This review primarily focuses on plant-derived CDs, with particular emphasis on their method of synthesis and their wide-ranging uses in the field of theranostics and biomedical sciences.
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Author keywords- Biogenic synthesis; Bioimaging; Carbon nanodots; Drug delivery; Theranostic applications

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	**67th**	**4.2**	03 GOOD HEALTH AND WELL-BEING

TARGETED DELIVERY OF THYMOQUINONE-ENCAPSULATED POLYETHYLENEIMINE/POLY (LACTIC ACID) NANOPARTICLES INTO BREAST CANCER CELLS

Pandi, J.S.; Parasuraman, P.; Babkiewicz, E.; Panneerselvam, T.; Maszczyk, P.; Murugesan, M.; Ramar, M.; **Selvaraj, S.**

Drug Development Research

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Abstract

Breast cancer is the most commonly diagnosed cancer globally, predominantly affecting older women. Thymoquinone (TQ) is a natural therapeutic agent that exerts anticancer efficacy. However, its pharmacological effects are restricted by inadequate aqueous solubility and bioavailability. The present study aimed to develop TQ-encapsulated polyethyleneimine/poly(lactic acid) nanoparticles (TQ-PEI/PLA-NPs) to enhance the delivery of TQ into breast cancer cells. The solvent evaporation-emulsification method was employed to synthesize TQ-PEI/PLA-NPs, and their physicochemical properties were subsequently examined. TQ-PEI/PLA-NPs had a crystalline structure, a zeta potential of +1 mV, and a spherical shape with a diameter of 80–90 nm. The encapsulation efficiency was 85.77 ± 2.21% (w/w), while the drug loading capacity was 9.32 ± 1.14% (w/w). The release rate of TQ from TQ-PEI/PLA-NPs was marginally elevated at pH: 5.8 (81.21 ± 0.87%) compared to pH 3.5 and 7.2. MTT assay using TQ-PEI/PLA-NPs confirmed concentration-dependent cytotoxicity against MCF-7 cells after 24 h of treatment, and IC 50 was found to be 21.99 µg/mL. The intracellular delivery of TQ in MCF-7 cells caused cell death, as indicated by AO/EBr staining, mitochondrial transmembrane potential assay, and Caspase-3 and -9 investigations. The observed MCF-7 cell death attributed to TQ was induced by reactive oxygen species (ROS) and impaired mitochondrial membrane potential. The ROS potentially damaged the mitochondrial membrane, and further studies supported the induction of apoptosis. Our results indicated that TQ-PEI/PLA-NPs, which cause cytotoxicity to breast cancer cells, as evidenced by the decreased MCF-7 cell counts, may exhibit significant therapeutic potential for breast cancer therapies.

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Author keywords- apoptosis; breast cancer cells; drug release; polymeric nanoparticles; thymoquinone

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	66th	3.83	12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 13 CLIMATE ACTION

CHARACTERIZATION OF NOVEL CELLULOSIC FIBER EXTRACTED FROM HIBISCUSENGLERI STEM FOR REINFORCEMENT IN POLYMER COMPOSITES

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Polymer Bulletin

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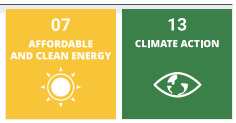


Abstract

Growing environmental consciousness about the need to replace nonbiodegradable materials with biodegradable ones has prompted several researchers to examine a wide range of bio-based materials for a variety of purposes. Hibiscus engleri is a plant that grows naturally in dry regions and is valued for its superior fiber. This work investigated the potential of a newly discovered H. engleri plant stem cellulosic fiber as a polymer composite reinforcing material. The test findings showed that H. engleri fiber had a density of 1150 kg/m3, demonstrating its lightweight nature. According to the results of the X-ray diffraction analysis investigation, H. engleri fiber was found to have a crystallinity index of 57.64% and a crystallite size of 6.08 nm. The thermogravimetric analysis revealed remarkable stability, with a char residue of 43.74% and a maximum degradation temperature of 352 °C. The H. engleri fiber was examined using a scanning electron microscope, which indicated that it had a very high coarse fracture surface with pores. The results of the experiment showed that the stem fibers of the H. engleri plant had characteristics that make them appropriate for use as reinforcement in the production of a biocomposite with potential applications.
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Author keywords- Crystallinity index; Plant fibers; Surface morphology; Tensile testing; Thermal stability

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**98th**	**9.1**	



TREE-BASED ENSEMBLE REGRESSION MODELS FOR EMISSION PREDICTION OF A WINTER GREEN OIL-HYDROGEN DUAL-FUEL ENGINE WITH ZEOLITE AFTER-TREATMENT

Josephin J S, F.; Subramanian, B.; Renjit, E.J.; S, N.V.; Sugumaran, V.; **Subramanian, T.**; Anka, F.; Varuvel, E.G.; Matijošius, J.; Kilikevičius, A.

Renewable Energy

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Alliance School of Applied Engineering



Abstract

This study presents an emission prediction framework for a dual-fuel compression-ignition engine operated on a 20 % winter green oil–diesel blend enriched with hydrogen and equipped with a zeolite-based after-treatment system. Extra Trees, Random Forest, Gradient Boosting, Extreme Gradient Boosting (XGBoost), and AdaBoost are the tree-based ensemble regression models used to predict the emission parameters under limited data conditions. The performance of the models was assessed through 5-fold cross-validation and a 20 % hold-out test method using R-Squared (R2), Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), and Mean Absolute Percentage Error (MAPE) as the evaluation metrics. Among the five tree-based regression models Extra Trees Regressor performed better with highest R2 values in the range of 0.99966–0.99974 and the lowest error metrics for all the emission parameters and demonstrates the outstanding robustness and generalization ability of the model. The stronger consistency of extra trees across different test samples was demonstrated by absolute error heatmaps, while the model's accuracy was further validated by comparing actual and predicted values. The study's overall findings demonstrate the potential of tree-based ensemble learning, and extra trees in particular, as a lightweight, accurate and reliable tool for real-time emission prediction in low-carbon dual-fuel systems.
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Author keywords- Alternative fuels; Dual fuel engine; Emission prediction; Ensemble learning algorithms; Machine learning algorithm

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	90th	6.9	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

MICROSTRUCTURAL REFINEMENT AND TRIBOLOGICAL RESPONSE OF CRYO-THERMAL TREATED INCOLOY 925 USING WEDM PROCESS

Mahendran, R.; Bhuvaneswari, V.; **Rajeshkumar, L.**; Ross, N.S.

Tribology International

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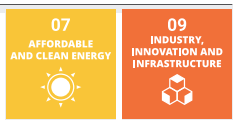


Abstract

Cryogenic treatment improves the machinability of a material and Incoloy 925 is one of the hard-to-machine materials. In the current work, Incoloy 925 is processed using deep cryogenic treatment at −185 °C with 12 h of soaking time to relieve the residual stresses and to improve the machinability of the material. Tempering was carried out at 300 °C for 3 h and cooled under two different conditions, viz., in ambient conditions and the furnace environment individually. The processed Incoloy 925 samples were characterized using X-ray diffraction analysis (XRD). Energy dispersive X-ray Spectroscopic analysis (EDAX) and Scanning Electron Microscopic analysis (SEM) for microstructural changes. The Specimens were then subjected to microhardness measurements and wire electrical discharge machining (WEDM) to assess the effect of cryogenic treatment and tempering on the material's machinability using material removal rate, surface roughness, and kerf width. The process parameters of WEDM were optimized using Entropy-EDAS methods. It was understood from the results that the cryo-treated and tempered Incoloy 925 exhibited refined crystal size and surface morphology. The cryo-treated and tempered Incoloy 925 with furnace cooling exhibited a high microhardness value and machinability owing to more refinement in microstructure during the treatment and tempering process. From the optimization results, a minimum surface roughness, maximum materials removal rate and kerf width were obtained for a pulse on time of 25 µs, a pulse off time of 48 µs and an input current of 4 A. These alloys find their applications in gas turbine shafts and pump shafts. © 2025 Elsevier Ltd.

Author keywords- Cryogenic treatment; Incoloy 925; Optimization; Tempering; WEDM

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**84th**	**4.2**	

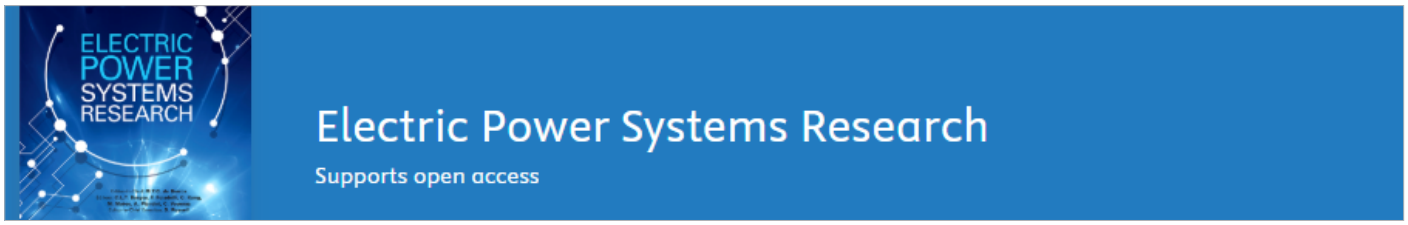


INTELLIGENT FAULT DETECTION IN BATTERY SYSTEMS: A MACHINE LEARNING APPROACH WITH TRANSFORMER-ENHANCED MULTI-MODAL SENSING

Antony, A.S.M.; Sundaram, K.M.; Raman, C.J.; **Ramana Murthy, G.R.**

Electric Power Systems Research

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Alliance School of Applied Engineering



Abstract

This study presents a new intelligent battery safety framework that improves fault detection and risk management from traditional static monitoring systems. The proposed method simultaneously used redundant multi-modal sensing of battery safety data with a Convolutional Autoencoder (CAE), followed by an anomaly classifier based on Transformer networks that captured spatial and temporal dependencies in sensing data for fault prediction. The proposed method introduces the use of Bayesian sensor fusion to correct the redundant measurements and fuzzy logic reasoning to convert anomaly scores into risk-based safety actions that support interpretable decision-making. The estimate of the State of Health (SoH) of the battery is derived from real-time fusion of thermal profiles, routing voltage, and cycle aging data, enabling fidelity in tracing degradation trends during faults. Experimental evidence of validity using MATLAB/Simulink and real-time hardware-in-the-loop fault injection indicates a 15 % reduction in false positives, fault detection accuracy up to 98 %, and reliable actuating capability within 20 ms. These results celebrate notable improvements over traditional single-modality, threshold systems, while providing robust, proactive safety for electric vehicles and grid storage applications. This research provides a definitive proof of concept for the CAE-Transformer-Fuzzy hybrid framework as an effective and implementable approach to adaptive battery management in dynamic and safety-critical situations. © 2025

Author keywords- Battery safety; Convolutional Autoencoder, Redundant architecture; Machine learning framework; Multi-modal sensing; Transformer-based anomaly detection

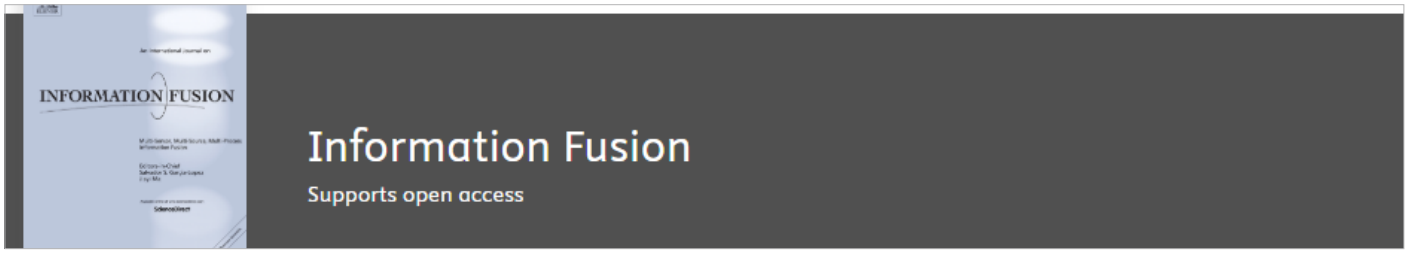
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	98th	15.5	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 11 SUSTAINABLE CITIES AND COMMUNITIES

URBAN DATA FUSION FOR SPATIO-TEMPORAL INCIDENT FORECASTING USING GRAPH ATTENTION AND GENERATIVE AI

Radhakrishnan, N.; Hemalatha, S.; Devarajan, G.G.; Nachiyappan, S.; Subramani, S.; Singhal, A.

Information Fusion

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Abstract

Accuracy and interpretability are two essential properties for any predictive model built on complex multi-source spatio-temporal data. In domains such as urban dynamics, environmental monitoring, and intelligent transportation systems, predictive models must effectively integrate heterogeneous data sources while maintaining transparency in decision making. This paper introduces a novel Two-Stage Attention Integrated Graph-Based Multi-source Spatio-Temporal Data Fusion Network (2S-AGMSTDF) that leverages generative AI-enhanced representations to improve both prediction accuracy and model interpretability. In the first stage, we perform external feature embedding using an Augmented Knowledge Graph Convolutional Network (AKGCN), spatial feature embedding via a GCN-ResNet-based Cross-Modality Transformer (GRCMT), and temporal feature embedding using an Attention-Based LSTM. The second stage fuses the learned embeddings through a Sparse Attentive Backtracking LSTM, enabling the model to trace influential patterns across modalities and time steps. This architecture allows for effective fusion of diverse data types, such as environmental indicators, mobility patterns, and auxiliary data such as traffic flow and point-of-interest (POI) information. The proposed method demonstrates how generative AI techniques can improve both the quality of the representation and the fusion process across modalities, enabling scalable and interpretable predictions in complex real-world scenarios. Extensive experiments on real-world urban datasets validate the superiority of 2S-AGMSTDF in terms of predictive performance and model transparency, making it a strong candidate for GenAI-based information fusion applications. © 2025

Author keywords- Data fusion; GenAI; Graph network; Interpretability; Temporal features

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**76th**	**1.8**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

A HYBRID NEURO-FUZZY OPTIMIZATION FRAMEWORK FOR SELF-HEALING AND LIFETIME ENHANCEMENT IN WIRELESS SENSOR NETWORKS

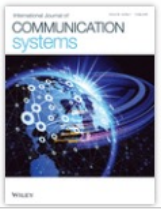
Lakshmi, S.; **Nanjappan, V.**; Suresh, G.; Vivek, C.

International Journal of Communication Systems

Dr. N. Vijayalakshmi
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International Journal of COMMUNICATION systems

Edited By: Professor Mohammad S. Obaidat
Online ISSN: 1099-1131
Print ISSN: 1074-5351



Latest issue
Volume 39, Issue 7
10 May 2026

Abstract

Wireless sensor networks (WSNs) are important in real-time applications such as environmental monitoring, health, and automation in industries. Nevertheless, maintaining stable communication and energy efficiency during topology changes and node failures also comes as one of the major challenges. The majority of the currently existing frameworks, such as GSO, OEPO-FPA, and fuzzy-based clustering, specialize in either optimization of energy consumption or fault tolerance, yet many of them do not combine those two concepts effectively. Also, such approaches usually do not have adaptive intelligence to adapt to the evolving network conditions. In order to overcome these shortcomings, the present study is proposing a hybrid neuro-fuzzy optimization (NFO) framework, that is a synergistic combination of fuzzy inference to handle the uncertainty and multilayer perceptron (MLP) to learn fault patterns dynamically, and use particle swarm optimization (PSO) to optimize routing and duty cycles on a global scale. The implementation of the model took place with MATLAB R2023b and NS-3 and was tested on the WSN-DS dataset that includes the main network parameters of residual energy, PDR, and link quality. The proposed approach achieved 92.4% fault detection accuracy, 85% packet delivery ratio, 80% residual energy retention, and extended network lifetime up to 970 rounds, resulting in an improvement of over 15%–25% compared with existing methods. The inclusion of a dynamic feedback loop ensures continuous rule refinement and performance adaptation. This unified and lightweight solution offers a scalable, resilient, and intelligent architecture for self-healing WSNs, presenting a promising direction for future deployments in resource-constrained, mission-critical environments. © 2025 John Wiley & Sons Ltd.

Author keywords- adaptive learning; neuro-fuzzy systems; particle swarm optimization; real-time fault detection; self-healing networks; wireless sensor networks

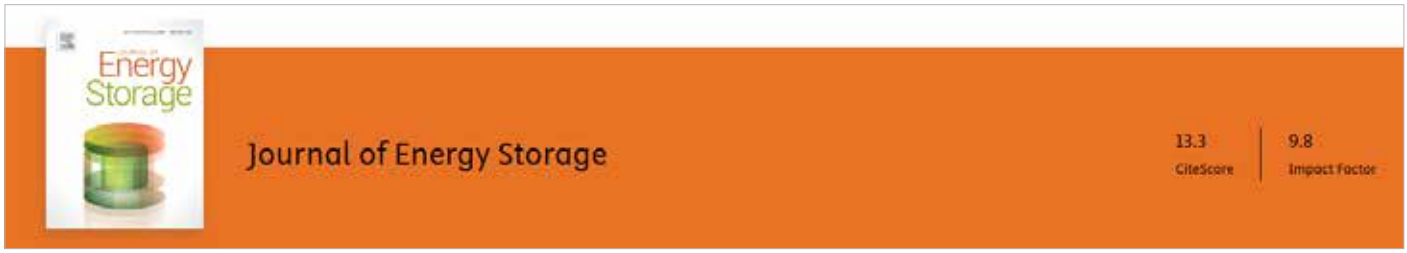
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	87th	9.8	07 AFFORDABLE AND CLEAN ENERGY; 13 CLIMATE ACTION

THERMAL ANALYSIS OF INTEGRATING PHASE CHANGE MATERIAL AND EVAPORATIVE COOLING FOR THERMAL POWER RESERVES VIA ELECTRONIC COOLING

Kannan, K.G.; Veerakumar, C.; Dhivagar, R.; Singh, P.K.; Khan, Y.; Mohan, M.; Kim, S.C.

Journal of Energy Storage

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Abstract

This experimental investigation reports the reserved thermal power in phase change material by electronic cooling with the implications of thermofluids due to evaporative cooling. Varied effectiveness, including convective heat coefficient, heat reclamation ratio, and thermal impedance, were evaluated using deionized water, fluorinert compound-72, hydrofluoroether-7200, and isopropanol as thermofluids under heat supply from 30 to 110 W at 20 W intervals. Myristic acid served as phase change material, and charging and discharging aspects with the implications of vaporized thermofluids were assessed. Findings suggest that fluorinert compound-72 affords the highest convective heat coefficient, heat reclamation ratio, and minimized thermal impedance at 110 W: 242.4 W/(m2·K), 99.2 %, and 0.28 K/W. Setup configuration, mass discharge rate, and thermofluid characteristics are causes of outcomes. A maximum thermal power reserve in phase change material is 10.8 W when employing fluorinert compound-72 at a high heat supply. This is owing to faster nucleation and minimal supercooling, which results in a higher mass discharge rate and rapid equilibrium temperature. The discrepancy between phase change material's experimental and actual thermal power reserve was computed as error efficiency for all thermofluids. A feasible maximum exergy efficiency was identified as 4.6 % for deionized water at 30 W due to a higher temperature gradient and reduced heat reclamation ratio. © 2025 Elsevier Ltd

Author keywords- Electronic cooling; Evaporative cooling; Phase change material; Thermal power reserves; Thermofluids

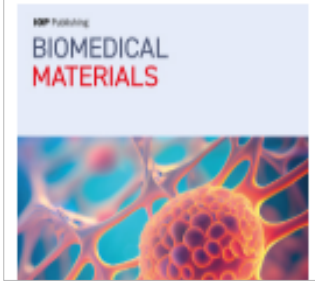
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	**67th**	**3.9**	03 GOOD HEALTH AND WELL-BEING

ENHANCED ANTICANCER ACTIVITY OF NARINGENIN-ENCAPSULATED POLY (LACTIC ACID)/NEEM GUM NANOPARTICLES FOR BREAST CANCER CELLS

Pandi, J.S.; Parasuraman, P.; Panneerselvam, T.; Sankaranarayanan, M.; **Selvaraj, S.**

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SUPPORTS OPEN ACCESS

Biomedical Materials publishes original research findings and critical reviews that contribute to our knowledge about the composition, properties, and performance of materials for all applications relevant to human healthcare.

Abstract

Naringenin (NGN) is a plant-derived flavonoid that has attracted significant interest due to its antioxidant and anticancer characteristics. However, its therapeutic applications are limited because of its low solubility in water, instability, and bioavailability at the target site. Therefore, the present study aimed to formulate NGN-encapsulated poly (lactic acid) (PLA)/neem gum (NEG) nanoparticles (NPs) to enhance their anticancer potency against breast cancer cells. The modified solvent evaporation-emulsification technique was followed to formulate NGN-PLA/NEG NPs, and their physicochemical properties, stability, drug release, and cytotoxic potentials were evaluated. The formulated NGN-PLA/NEG NPs showed a semi-crystalline nature, a zeta potential of +0.152 mV, a polydispersity index of 0.234, and a z-average particle size of 44.14 nm with spherical shape. NGN's encapsulation efficiency and loading capacity into PLA/NEG NPs were 77.72 ± 1.38% (w/w) and 8.57 ± 0.4% (w/w), respectively. At pH 5.8, NGN-PLA/NEG NPs released more NGN (78.46 ± 0.96%) than at pH 3.5 and 7.4. The MTT assay showed that NGN-PLA/NEG NPs had a significantly higher cytotoxic efficacy than free-NGN in Michigan Cancer Foundation 7 (MCF-7) cells, with an IC50of 31.51 µg ml-1. The IC50concentration of NGN-PLA/NEG NPs significantly elevated the intracellular reactive oxygen species level, caspase-3 and -9 activity, and triggered apoptosis in MCF-7 cells. Apoptotic indicators, such as membrane blebbing and nuclear disintegration, have been observed in cancer cells treated with NGN-PLA/NEG NPs. These findings suggested that NGN-PLA/NEG NPs, which target NGN delivery into MCF-7 cells and promote endocytosis, could have potent anticancer activity against breast cancer cells. © 2026 IOP Publishing Ltd. All rights, including for text and data mining, AI training, and similar technologies, are reserved.

Author keywords- MCF-7 cells; nanoparticles; Naringenin; neem gum; targeted drug delivery

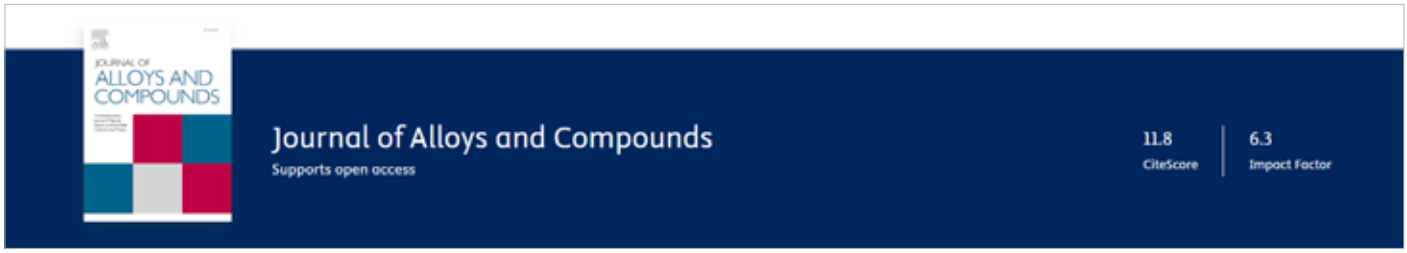
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**91st**	**6.3**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

DUAL ANTI-THERMAL QUENCHING IN PR3+-DOPED LITAO3 SINGLE-CRYSTAL FIBERS FOR HIGH-PERFORMANCE OPTICAL THERMOMETRY

do Carmo, F.F.; de Azevedo, L.A.F.; Do Nascimento, J.P.C.; Nogueira, F.E.A.; da Silva, M.A.S.; **Singh, C.**; da Silva, R.S.; Sombra, A.S.B.

Journal of Alloys and Compounds

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Abstract

Optical thermometry based on rare-earth luminescence is attractive for noncontact temperature sensing, but conventional phosphors often suffer thermal quenching. Here we report the first demonstration of pronounced negative thermal quenching (NTQ) in Pr3+-doped LiTaO3 single-crystal fibers (SCFs) grown by laser-heated pedestal growth (LHPG), with NTQ observed for the 1D2→3H4 emission (613 nm) under both intervalence charge transfer (IVCT; 355 nm) and direct f–f excitation (450 nm) — a "dual anti-thermal quenching" behavior. Rietveld refinement confirmed phase-pure rhombohedral R3c crystals (x = 0.25–1.0 mol% Pr3+); characteristic Pr3+ absorption and emissions were observed, and the optical band gap was approximately 3.6 eV. Under 355 nm excitation, the 1D 2 → 3H 4 ntensity increases by up to 230 % at 483 K (compared to 303 K), while the 3P 0 → 3H4 (509 nm) transition shows conventional thermal quenching. The fluorescence intensity ratio (FIR) rises monotonically from 303 K to 483 K for all compositions and both excitations, enabling robust thermometry using Non-Thermally Coupled Levels (NTCL) modeled by exponential fits. The highest absolute sensitivity reaches 0.114 K–1 (355 nm), and the maximum relative sensitivity attains 0.94 % K–1 (450 nm) at 483 K. Temperature uncertainties as low as 0.46 K (355 nm) and 0.57 K (450 nm) at 483 K with greater than 99 % repeatability were obtained. Mechanistic analysis attributes NTQ to temperature-activated IVCT-assisted population of 1D 2 and multiphonon relaxation, modulated by cross-relaxation at higher Pr3+ contents. These results position Pr3+:LiTaO 3 SCFs as promising, high-stability platforms for precise optical thermometry over a wide 303 – 483 K range.
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Author keywords- Negative thermal quenching; Optical temperature sensing; Single crystal fibers

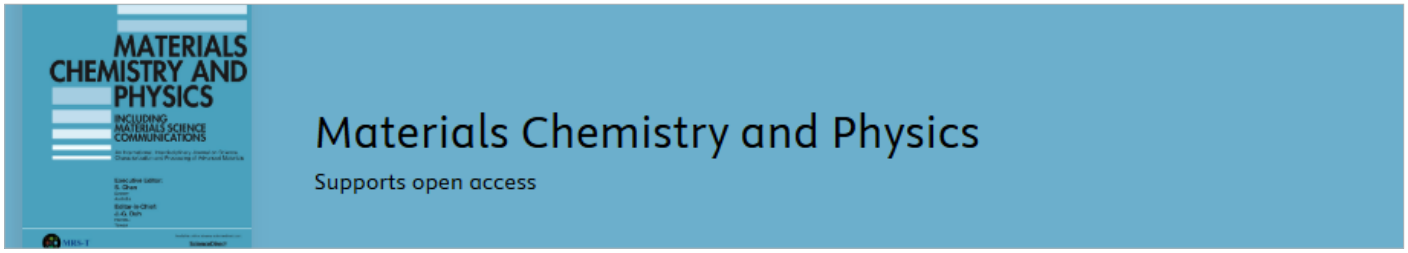
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**84th**	**4.7**	03 GOOD HEALTH AND WELL-BEING

SYNTHESIS OF BIMETALLIC (FE/BI) OXYCHLORIDE NANOSHEET-ENTANGLED RODS (FBOCNR) FOR OSTEOSARCOMA NANO-THERAPY

Talreja, N.; Chauhan, D.; Sindya, J.; Perumal, E.; Fareed, M.; Ashfaq, M.

Materials Chemistry and Physics

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Abstract

Osteosarcoma (OS) is a bone cancer that is distinguished by osteoid and immature bone formation, having a high incidence rate in adolescents and children. OS is resistant to chemotherapy and less sensitive to radiotherapy, thereby making it challenging to treat OS. In this context, this study aims to produce Fe metals incorporated Bismuth oxychloride (BiOCl)-based nanosheets assembled rods (FBOCNR)-based nanomedicine for treating OS cells. The synthesized FBOCNR-based nanomedicine effectively destroys/kills OS cells, confirmed by MTT assay, structural analysis, fluorescence microscopy (acridine orange/ethidium bromide (AO/EtBr)), and expression of apoptotic genes. The MTT assay showed a dose-dependent cytotoxic effect of FBOCNR nanomedicine, with an IC50 of FBOCNR-0 (234.12 μg/mL), FBOCNR-0.5 (160.73 μg/mL), and FBOCNR-1 (185.15 μg/mL). Morphological analysis revealed apoptotic changes, including cell shrinkage, membrane blebbing, and reduced cell density. AO/EtBr staining confirmed increased apoptotic cell death in treated OS cells. Bright orange/red fluorescence indicated a greater fraction of apoptotic cells compared with that of controls. The FBOCNR-based nanomedicine downregulates Bcl2 and upregulates pro-apoptotic markers Bad, Bax, and caspase-3, enhancing programmed cell death. Therefore, the prepared FBOCNR-based nanomedicine provides newer possibilities for treating OS cells.
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Author keywords- Bismuth; Cancer; Nanomedicine; Nanosheets; Osteosarcoma

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	**73rd**	**2.7**	03 GOOD HEALTH AND WELL-BEING; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

ECO-FRIENDLY SYNTHESIS AND CHARACTERIZATION OF COPPER NANOPARTICLES USING THALASSIA HEMPRICHII SEAGRASS: EVALUATION OF ANTIOXIDANT AND ANTIBACTERIAL ACTIVITIES

Santhiya Selvam, M.; Tresina Soris, P.S.; Rajalakshmi, R.; Solomon, S.; **Rajeshkumar, L.**; Mohan, V.R.

Materials Letters

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Abstract

This study investigats the green synthesis of copper nanoparticles (CuNPs) using the aqueous extract from the Thalassia hemprichii, a species of seagrass. Phytochemical analysis of the extract confirmed the presence of various bioactive compounds, including catechins, phenols, quinones, flavonoids, saponins, steroids, tannins, and glycosides. UV–Visible spectroscopy revealed a surface plasmon resonance peak at 277 nm. Fourier-transform infrared spectroscopy confirmed the presence of flavonoids and phenolic compounds. Scanning electron microscopy showed that the CuNPs were spherical in shape, while X-ray diffraction analysis verified their crystalline structure. Atomic force microscopy was used to assess surface topography. The CuNPs exhibited strong antioxidant activity, demonstrated by a high percentage of DPPH radical scavenging. These findings highlight the potential of green-synthesized CuNPs for multifunctional biomedical applications.
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Author keywords- Antibacterial; Antioxidant; Copper nanoparticles; Seagrass

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	84th	3.9	02 ZERO HUNGER

A MULTIKINASE INHIBITOR AX-0085 BLOCKS FGFR1 ACTIVATION TO OVERCOMES OSIMERTINIB RESISTANCE IN NON-SMALL CELL LUNG CANCER

Rhie, B.-H.; Karapurkar, J.K.; Kim, H.-Y.; Woo, S.H.; Gowda, D.A.A.; Kim, D.H.; Choi, M.J.; Park, Y.J.; **Matam, V.**; Hong, Y.; Hong, S.-H.; Ramakrishna, S.; Kim, K.-S.

Biomedicines

Dr. Matam Viswanathaiah
Professor & Registrar
Finance
Administration



Abstract

Background: Osimertinib is a third-generation epidermal growth factor receptor (EGFR) tyrosine kinase inhibitor (TKI) with high efficacy in treating patients with advanced non-small cell lung cancer (NSCLC) harboring EGFR-activating mutations. Although osimertinib is a frontline anticancer agent for NSCLC, several patients inevitably develop tumor recurrence caused by osimertinib resistance. The activation of anexelekto (AXL) or fibroblast growth factor receptor 1 (FGFR1) is reported as a major factor driving osimertinib resistance in NSCLC. Thus, targeting AXL and FGFR1 offers the potential to overcome osimertinib resistance. Methods: In this study, we generated osimertinib-resistant cell lines from EGFR-mutant NSCLC cell lines in vitro and investigated the biological significance of AX-0085 on these cell lines by conducting transcriptomic analyses. Results: The expression of several genes associated with MAPK, ERK, and FGF receptor signaling pathways, including AXL, was altered upon AX-0085 treatment of osimertinib-resistant cells. Furthermore, AX-0085 treatment effectively blocked AXL and FGFR1 activation and sensitized osimertinib-resistant cells. Additionally, AX-0085 inhibited AXL and FGFR1-dependent oncogenic events, including cell proliferation, clonogenicity, and migration. Conclusions: The dual inhibition of AXL and FGFR1 by AX-0085 can overcome acquired osimertinib resistance, supporting its potential as a therapeutic strategy for treating patients with osimertinib-resistant tumors.
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Author keywords- AX-0085; AXL; FGFR1; NSCLC; osimertinib resistance

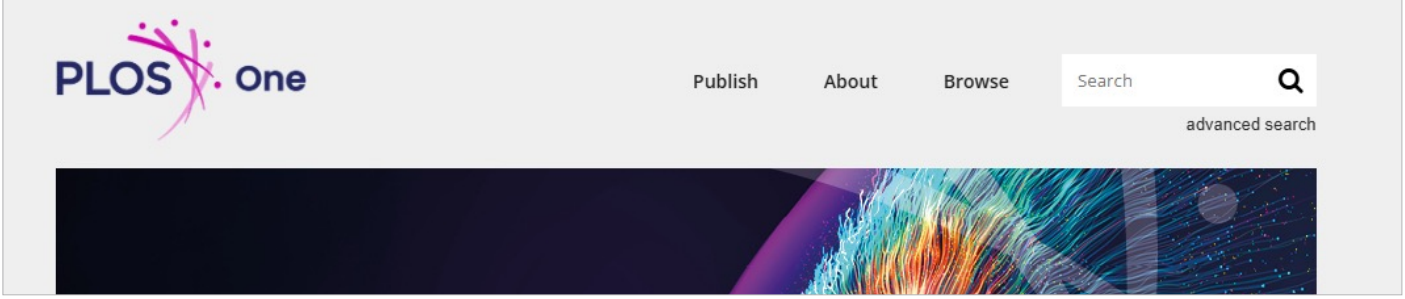
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**86th**	**2.6**	02 ZERO HUNGER, 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

LEAFAI: INTERPRETABLE PLANT DISEASE DETECTION FOR EDGE COMPUTING

Kafi, MdA.A.; **Banshal, S.K.**; Moni, R.; Aziz, A.L.; Aljuaid, M.; Bansal, R.

PLOS ONE

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Abstract

In real-world agriculture, healthy plant leaves are significantly more common than diseased ones. This natural class imbalance presents challenges in automated plant disease detection, as analyzing each leaf with computationally intensive deep-learning models is problematic, leading to inefficiency and increased resource consumption. To tackle this challenge and promote sustainable AI solutions, this study presents an iterative, hybrid AI approach that boosts computational efficiency, interpretability, and scalability for real-time disease detection. This hybrid system operates in two stages: first, a lightweight traditional machine learning classifier performs binary classification to quickly separate and exclude healthy leaves, followed by a deep learning model (ResNet, DenseNet, MobileNet, and EfficientNet) that classifies the specific disease in the smaller group of diseased leaves. This two-stage method minimizes computational load while maintaining high classification accuracy. Additionally, this study uses Explainable AI (XAI) methods, particularly Gradient-weighted Class Activation Mapping (Grad-CAM), to generate heatmaps. These heatmaps highlight the image areas that most significantly influence the model's predictions, thereby improving transparency and refining the feature extraction process. The proposed hybrid model, comprising Logistic Regression and Mobilenetv3, offers up to 77.6% faster inference than conventional deep learning models with only about 3% accuracy loss. For a large-scale test of 1,227 images on an entry-level laptop, the hybrid model reduced the total inference time from 4,548 seconds to just 1,010.13 seconds, with minimal CPU load. By addressing class imbalance, optimizing inference efficiency, and incorporating explainable AI, this work contributes a scalable, sustainable, and trustworthy solution for plant disease detection in precision agriculture. © 2026 Kafi et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**88th**	**3.4**	

TOWARD SUSTAINABLE POLYMER COMPOSITES: SYNERGETIC EFFECTS OF SURFACE-TREATED MIMUSOPS ELENGI SEED SHELL POWDER ON POLYPROPYLENE PROPERTIES

Munusamy, Y.; Mathialagan, M.; Tan, W.C.; Al-Mahmodi, A.F.; **Suyambulingam, I.**

Journal of Thermoplastic Composite Materials

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Abstract

The increased demand for non-renewable, petroleum-based plastics and their negative impacts on human and environmental sustainability has led researchers to develop bio-composites to make eco-friendly materials from renewable and natural resources. These materials minimize plastic manufacturing carbon footprints while performing well. In this study, NaOH treatment of Mimusops elengi seed shell powder (MESSP) affects density, chemical functionality and composition, surface shape, and thermal degradation. It also examines the properties of polypropylene (PP) composites incorporating untreated and NaOH-treated MESSP, with sodium hydroxide concentrations ranging from 5 to 8 wt%. A series of PP composites containing untreated and NaOH-treated MESSP, with filler loadings varied between 0 and 20 wt%, was produced via melt mixing method in an internal mixer. MESSP particle treatment with 5 wt% NaOH effectively enhanced the chemical functionality, cellulose content, and particle morphology as confirmed through FTIR and SEM analysis. The treatment of MESSP resulted in a noticeable reduction of hydroxyl (OH) functional groups, confirming a decrease in its hydrophilicity. Morphological analysis revealed increased porosity in the treated MESSP and improved adhesion of the PP matrix to MESSP. At 15 wt% loading (optimum), PP/TMESSP composite exhibited 30% and 28% enhancement in tensile strength and impact strength, respectively compared with PP/MESSP composite. Since they absorbed less water than PP/MESSP composites, PP/TMESSP composites had superior water absorption resistance. This study could lead to eco-friendly polymeric materials for packaging, automobile, and construction. © The Author(s) 2026

Author keywords- environmental sustainability; mimusops elengi; Natural fiber; SDG 1: environment; SDG 1: sustainable, surface treatment

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**93rd**	**4.2**	08 DECENT WORK AND ECONOMIC GROWTH; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

ETHICAL CONSUMPTION: VARIATIONS RELATED TO GENERATIONAL COHORTS AND GENDER AMONG CONSUMERS WITHIN EGYPT'S RESTAURANT INDUSTRY

Elkhwesky, Z.; Kolaly, H.E.; Taher, A.; Rodríguez-Molina, M.A.; **Gumbo, A.R.**

Environment, Development and Sustainability

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Abstract

Ethical consumption remains underexplored in emerging markets such as Egypt, where generational and gender differences may influence consumer behavior. Drawing on the theory of planned behavior (TPB), this study examined the relationships between interdependent self-construal (ISC), attitude toward ethical consumption (ATT), and ethical consumption intention (ECI). Data were collected through a survey of 740 restaurant consumers (Generations Y and Z, males and females) and analyzed using structural equation modeling and multigroup analysis in R. ISC had a significant positive effect on ATT (), ATT significantly predicted ECI (), and ISC also had a direct influence on ECI (). Multigroup analysis revealed significant generational differences between Gen Y and Gen Z and significant gender differences between male and female consumers. By integrating cultural and psychological dimensions into TPB, this study advances understanding of ethical consumption in an emerging market context. The findings provide theoretical insights for ethical consumption research and practical guidance for restaurants to generationally and gender-sensitive strategies. The findings also offer clear guidance for developing culturally informed ethical marketing practices and policy measures that can support responsible consumption in emerging economies.
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Author keywords- Ethical consumption; Consumer; Egypt; Interdependent self-construal; Restaurant; SDG 12; Sustainability

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**88th**	**3.4**	

VALORIZATION OF AGRO-INDUSTRIAL RESIDUES FOR PLA-BASED BIOCOMPOSITES: ROLE OF MAPP COMPATIBILIZATION IN MECHANICAL AND THERMAL OPTIMIZATION

Chaudhary, V.; Prakash Pathariya, M.S.; Ahlawat, C.; B, S.; **Senthamaraikannan, P.**; Avudaiappan, S.

Journal of Thermoplastic Composite Materials

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The *Journal of Thermoplastic Composite Materials* (JTCM) publishes peer-reviewed research on polymers, nanocomposites, and particulate, discontinuous, and continuous-fiber-reinforced materials in the areas of processing, materials science, mechanics, durability, design, non destructive evaluation, addictive manufacturing and manufacturing science. There is a ... | View full journal description
This journal is a member of the Committee on Publication Ethics (COPE).

Abstract

Mechanical, thermal, and structural improvements of natural fiber (Aloe vera and Eucalyptus) reinforced polylactic acid (PLA) composites with agro-waste fillers (Rice Husk and Wheat Husk) without and with maleic anhydride grafted polypropylene (MAPP) as a compatibilizer are reported in the present study. The composites comprise 70% PLA and 30% reinforcements, fillers, and MAPP. In hybrid composites, 70% PLA is combined with 10% fiber reinforcement, 10% fillers, and 10% MAPP. Ten formulations were produced and systematically investigated through measuring surface roughness, hardness, tensile, and flexural properties, impact strength, density, creep, fatigue, and thermal conductivity. The incorporation of MAPP had a substantial effect on fiber–matrix interface, contributing to the enhanced load transfer ability, dimensional stability, and energy dissipation. APWM and APRM had better tensile strength, fatigue performance was better, and flexural and thermal properties of EPWM and EPRM were good. Tensile, impact strength and creep resistance were also significantly improved in MAPP-modified composites. Composites with hybrid reinforcement were always better than those with either type of reinforcement or no reinforcement, indicating synergy in hybrid reinforcement. Although uncompatibilized and particulate-only composites showed moderate increase, they were still inferior to those of MAPP-modified counterparts. The results highlight the potential of lignocellulosic fiber–filler systems for the sustainable development of high-performance PLA composites. Morphological analysis of fractured surfaces was performed using scanning electron microscopy (SEM) to evaluate interfacial adhesion between the reinforcements and the polymer matrix. © The Author(s) 2026

Author keywords- MAPP; PLA; surface modification; Thermal and mechanical properties

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	69th	4.1	12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 13 CLIMATE ACTION

GREEN SYNTHESIS AND CHARACTERIZATION OF PLA-BASED BIO-COMPOSITES REINFORCED WITH CELLULOSE FILLERS AND FIBERS

Chaudhary, V.; Ahlawat, C.; Mishra, R.; Verma, M.K.; Gupta, P.; **Senthamaraikannan, P.**

Biomass Conversion and Biorefinery

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Abstract

Present research focused on the addition of bio fibers (soyabean and corn) with bio fillers (coconut shell and walnut shell powder) and biopolymer (polylactic acid) for composite fabrication. Characterization of developed sample includes the hardness, tensile, flexural, and impact test. Outcomes evidently shows that addition of fillers and fibers enhanced the hardness value of composite specimen as compared to neat PLA composite specimen. Maximum hardness value of 98 Shore-D was achieved by SPW composite. Addition of walnut fillers achieved higher tensile strength of developed bio composites. Among all the developed bio composite specimens, SPW composite specimens achieved highest tensile strength of 57.82 MPa and neat PLA exhibits minimum tensile strength of 23.54 MPa. Incorporation of coconut filler with soyabean fiber and walnut filler with corn fiber gives better flexural strength as compared to other developed bio composites. SPC composite specimens achieved highest flexural strength of 59.59 MPa and neat PLA exhibits minimum flexural strength of 23.32 MPa. SPW composite achieved maximum impact strength of 18.8 Joule. At 25% UTS, SPC composite achieved maximum fatigue cycle of 3640 and minimum fatigue cycle of 3089 was demonstrates by neat PLA composite. At 50% UTS, SPC composite got maximum fatigue cycle of 3640 and minimum fatigue cycle of 3089 was shows by neat PLA composite. At 75% UTS, SPC composite reached maximum fatigue cycle of 2634 and minimum fatigue cycle of 1767 was shows by neat PLA composite. At 2000 sec, minimum creep strain of 0.0097 was exhibits by neat PLA composite while maximum creep strain of 0.062 was exhibited by SPC composite. Maximum creep strain of 0.1 was shown by SPC composite at 15000 sec.

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Author keywords- Bio composites; Coconut powder; Corn fiber; Polylactic acid (PLA); Soyabean fiber; Walnut powder

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	**66th**	**3.8**	03 GOOD HEALTH AND WELL-BEING; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

SYNTHESIS OF WASTE-DERIVED TAMARINDUS INDICA FRUIT (WD-TIF)-BASED POLYPHENOL-ENCAPSULATED AG-NPS: A NEXT-GENERATION SUSTAINABLE ANTIBIOTIC MATERIAL

Salem, G.E.M.; El-Sakhawy, M.A.; Mohammad, Z.Z.A.E.-H.; Mohamed, S.A.; **Talreja, N.**; Tongdeesoontorn, W.; Ashfaq, M.

Biocatalysis and Agricultural Biotechnology

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Abstract

The emergence of bacterial resistance has been incessantly increasing and is one of the most pressing global health threats today. Bacterial resistance is a "silent pandemic" that requires immediate, effective intervention rather than deferral to a future scenario. Therefore, the sustainable development of NPs might address issues associated with conventional synthesis while maintaining high biocompatibility. In this regard, the present study focuses on the synthesis of Ag-NPs from waste of Tamarindus indica fruit (WD-TIF-Ag) via a microwave process. The WD-TIF simultaneously acted as a reducing and encapsulating agent, thereby significantly improving the effectiveness of the WD-TIF-Ag composite due to its polyphenol content. The as-prepared WD-TIF-Ag composite was characterised using scanning electron microscopy (SEM), energy-dispersive X-ray spectroscopy (EDX), X-ray diffraction (XRD), and Fourier-transform infrared (FTIR) spectroscopy. The data confirms the successful synthesis of spherical Ag-NPs with a primary crystallite size of ~12.5 nm and composite clusters in the 40–60 nm range. The as-prepared WD-TIF-Ag composite has effective antibacterial activity against both gram-negative (Escherichia coli (E. coli)) and gram-positive (Staphylococcus aureus (S. aureus)) bacterial strains. The MIC value (10 µg/mL) and MBC value (40 µg/mL) of the WD-TIF-Ag composite were observed against S. aureus. Therefore, the as-prepared WD-TIF-Ag developed in this study is a facile, cost-effective, and sustainable approach to the development of antibiotics.
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Author keywords- Antibacterial activity; Green chemistry; Microwave; Nanoparticles; Waste materials

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**97th**	**11.6**	03 GOOD HEALTH AND WELL-BEING; 09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

A NOVEL GRAPH-EMBEDDED MUSICAL CHAIRS OPTIMIZATION WITH SECURE ELLIPTIC ENCRYPTION FRAMEWORK FOR INTELLIGENT EDGE COMPUTING IN HEALTHCARE IOT NETWORKS

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Journal of Industrial Information Integration

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Abstract

Internet of Things (IoT) health systems have severe issues distinguishing malicious from legitimate traffic and ensuring secure and efficient data transmission for real-time patient care. Existing solutions have high complexity, low dynamic attack adaptability, and low encryption strength. For the purpose of solving these problems, this study suggests a security-enhanced intelligent edge computing system that involves Normalized Distance-Based Encoding (NDBE) for effective feature extraction, Adaptive Layout Decomposition with Graph Embedding Neural Networks (ADGENN) for malicious data identification, Musical Chairs Optimization Algorithm (MCOA) for adaptive hyperparameter tuning, and a novel Light-weight Dynamic Elliptic Curve Cryptography with Schoof's Algorithm (LDECCSA) for data encryption protection. Together, these modules enhance classification efficiency, reduce computational costs, and facilitate low-latency, safe communication. Evaluated on the ToN-IoT and CICIoMT2024 dataset, the system achieves up to 99.87 % accuracy, 97 % throughput, and a low latency of 1.2 s, which performs better than current cutting-edge solutions by a large margin. The significance of this work is that it has the capacity to handle some of the most significant issues in healthcare. Systems are currently confronting, wherein IoT devices and edge computing have taken patient tracking to a new height, but also created gargantuan challenges such as cyberattacks, data breaches, and performance congestion. The major novelties are the application of NDBE for pre-processing network traffic, dynamic graph-based classification through ADGENN, resource-aware optimization through MCOA, and light-weighted, secure ECC with dynamic curve generation. While the model shows better efficiency and resilience, its dependence on pre-labeled datasets might restrict flexibility towards unknown real-world threats, and resource-limited IoT devices might struggle with heavy computation. In summary, the framework offers a real-world, scalable solution for real-time threat identification, secure data transfer, and effective healthcare surveillance in an IoT-based, cutting-edge healthcare environment. © 2025

Author keywords- Graph embedding neural networks; Light-weight dynamic elliptic curve cryptography; Musical chairs optimization algorithm; Normalized distance-based encoding; Schoof's Algorithm

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**84th**	**4.6**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

RADIO FREQUENCY AND MICROWAVE DIELECTRIC PROPERTIES OF PYROCHLORE CAMTINBO7 (M = BI, Y) CERAMICS

do Carmo, F.F.; Nogueira, F.E.A.; Do Nascimento, J.P.C.; Abreu, T.O.; da Silva, M.A.S.; da Silva, R.S.; **Singh, C.**; Sombra, A.S.B.

Materials Science and Engineering: B

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Abstract

Two pyrochlore-structured ceramics, CaMTiNbO7 (M = Y, Bi), were synthesised via solid-state reaction. X-ray diffraction analysis confirmed the formation of CaYTiNbO7 (CYNTO) and CaBiTiNbO7 (CBNTO). Dielectric properties in radio frequency (RF) range were examined using Complex Impedance Spectroscopy (CIS), which showed that CBNTO exhibited higher permittivity than CYNTO. Temperature Coefficient of Capacitance (TCC) values indicated that ceramics could be classified as Class 1 capacitors according to EIA RS-198. In the microwave region, CBNTO demonstrated a permittivity (ε′r) of 64, a loss tangent (tan δ) of 1.79 × 10−3, and a temperature coefficient of resonant frequency (τf) of + 176 ppm·°C−1. In comparison, CYNTO exhibited ε′r = 110, tan δ = 3.23 × 10−3, and τf = +408 ppm·°C−1. The materials were evaluated as dielectric resonator antenna (DRAs), exhibiting a realised gain above 3.40 dBi, directivity greater than 4.70 dBi, and radiation efficiency above 70 %. These results showed that the ceramics are suitable for S-band applications. © 2025 Elsevier B.V.

Author keywords- CaBiTiNbO7; CaYTiNbO7; Dielectric properties; DRA; Positive τf

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	72nd	2.8	12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 13 CLIMATE ACTION

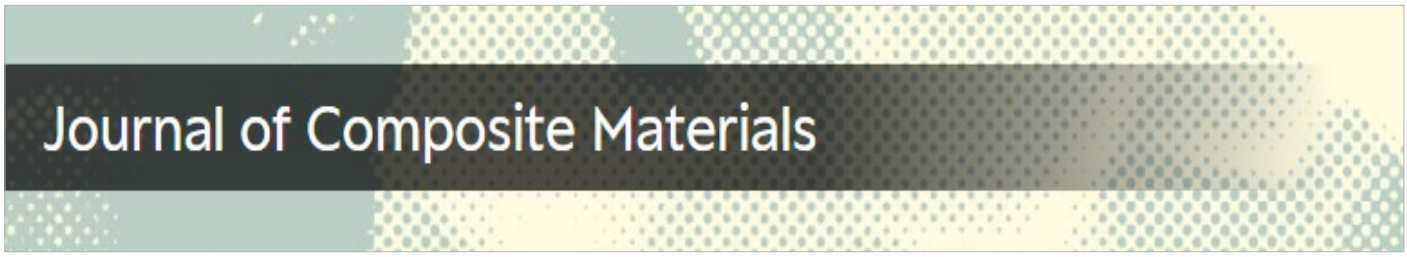
STRUCTURAL AND THERMAL INTEGRITY OF KEVLAR FABRIC – CRUMB RUBBER SANDWICH POLYMER COMPOSITE

Venkatesh, V.; Shahapurkar, K.; Kanaginahal, G.; Gebremaryam, G.; Bhaviripudi, V.R.; Tirth, V.; Algahtani, A.; Hm, V.

Journal of Composite Materials

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Abstract

The global administrations are focusing much on the development of sustainable materials, and that too with the help of industrial waste. The inclusion of wastage not only sustains the green environment but also avails the cost-benefit in disposing of the waste. The present research targets the processing of a novel sandwich Kevlar fibre woven resin-impregnated composite reinforced core with by-products of waste tyres called crumb rubbers. The usual open moulding technique was followed to fabricate the sandwich composite with varying weight percentages of crumb rubber as 0, 5, 10 and 15 (KF-CR-0, 5, 10, 15). The structural and thermal rigidity of the proposed composite was examined through tensile testing and thermogravimetric analysis (TGA). The tensile test results indicate the exceptional structural rigidity of KF-CR-15 by possessing 68.30 % higher tensile strength than KF-CR-0. The TGA result corroborates a delayed thermal degradation of the sandwich composite with higher crumb rubber loading. Further, the results reveal that 51 % escalated width of thermal degradation is observed for the sandwich composite with a higher loading of crumb rubber than the zero loading. The fracture morphology executed after the tensile test distinguishes the delamination effect and firm bonding to proclaim a clear understanding of the strengthening mechanism.
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Author keywords- crumb rubber; Kevlar fibre woven mat; sandwich panels; tensile test; thermogravimetric analysis

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	**54th**	**2.8**	03 GOOD HEALTH AND WELL-BEING

CALCIUM DYNAMICS UNPLUGGED: NCLX IN DISEASE AND THERAPEUTIC FRONTIERS

Majumder, D.

Molecular Biology Reports

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Abstract

Mitochondrial ion channels and transporters are pivotal for cellular bioenergetics, signalling, and homeostasis, with the sodium-calcium-lithium exchanger (NCLX) emerging as a critical regulator of mitochondrial calcium dynamics. By extruding calcium in exchange for sodium or lithium ions, NCLX prevents calcium overload, a key contributor to mitochondrial dysfunction and cell death. While previous reviews have explored NCLX in the context of specific diseases or immune cell function, this article provides a comprehensive analysis of its role across multiple disease states, including cardiovascular, neurological, metabolic, and pregnancy-related conditions. Moreover, it highlights the potential of ethnobotanical compounds such as resveratrol and curcumin as therapeutic candidates targeting NCLX. By integrating insights from structural biology, disease mechanisms, and emerging therapeutic strategies, this review aims to advance our understanding of NCLX's role in pathophysiology and explore novel avenues for its targeted modulation in diseases characterized by disrupted mitochondrial calcium homeostasis.
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Author keywords- Calcium exchange; Cardiovascular diseases; Mitochondria; NCLX; NCLX targeting therapeutics; Neurodegeneration

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**87th**	**5.3**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

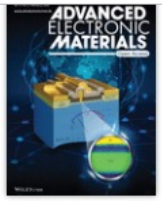
FERROELECTRIC HZO THIN FILMS FOR FEFETS: CRYSTAL STRUCTURE-DEVICE PERFORMANCE RELATIONSHIP

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Advanced Electronic Materials

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Latest issue
Volume 12, Issue 3
4 February 2026

Abstract

The rapid development of hafnium zirconium oxide (HZO) thin films has established ferroelectric field-effect transistors (FeFETs) as strong candidates for future non-volatile memory and logic-in-memory (LiM) technologies. While earlier reviews mainly offered broad overviews, this work introduces a conceptual framework connecting deposition methods, phase stability, and device performance. This work categorizes fabrication techniques (ALD, CVD, PVD, CSD) based on their influence on phase stabilization and transformation, supported by comparative tables and schematic diagrams illustrating their impact on FeFET operation. A dedicated section discusses reliability challenges (wake-up, fatigue, imprint, retention loss), contrasting ferroelectric capacitors (FeCAPs) with FeFETs to highlight device-level complexities. Additionally, a comparative performance table of reported FeFET stacks summarizes key metrics such as remanent polarization, threshold voltage control, retention, and endurance. By combining thorough comparison with conceptual categorization, this review provides both a structured perspective and practical insights into integrating HZO-based FeFETs into future computing systems.
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Author keywords- complementary-metal-oxide-semiconductor compatibility; FeFET; ferroelectricity; hafnium zirconium oxide; logic-in-memory; non-volatile memory; orthorhombic phase (Pca21); thin film deposition

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**92nd**	**8.5**	12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 13 CLIMATE ACTION

CELLULOSIC SUNNHEMP FIBRES AND THEIR ROLE IN POLYMER COMPOSITES — A COMPREHENSIVE REVIEW

Pavan, M.; Samant, L.; Nageshkumar, T.; Ammayappan, L.; Manjunatha, B.S.; **Suyambulingam, I.;** Selvan, A.; **Senthamaraikannan, P.**

International Journal of Biological Macromolecules

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Abstract

Sunnhemp, an ancient yet underexplored plant, is emerging as a multifunctional resource capable of nourishing soils, weaving sustainable textiles, and reinforcing eco-friendly polymer composites for a greener future. Among the various options being explored, Crotalaria juncea (sunnhemp) stands out as a versatile green-manuring crop with a multitude of applications. The plant has gained significant importance due to its economic and ecological value, offering benefits such as intercropping, CO_2 sequestration, wind-breaking, nematode resistance, livestock feed, nitrogen fixation, biomass generation, and textile-grade bast fibre production. The high-quality bast fibres make it an ideal candidate for sustainable textile fibre production, requiring only the stem part of the plant for fibre extraction while the remaining biomass is utilizable for soil enrichment or energy generation. With its low density, optimal cellulose content, and good tensile strength, sunnhemp fibre is suitable not only for technical and traditional textiles but also as a renewable reinforcement material in polymer composites, including automotive parts, construction panels, and packaging. This paper provides an overview of sunnhemp as a sustainable crop, covering botanical description, growth characteristics, cultivation, production, current scenario, and applications in agriculture, textiles, and composites, with emphasis on challenges, barriers in fibre extraction and processing, and future prospects.
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Author keywords- Composites; Green manuring crop; Reinforcement; Sunnhemp fibre, sustainable fibre; Technical textiles

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**92nd**	**8.5**	12 RESPONSIBLE CONSUMPTION AND PRODUCTION

A COMPREHENSIVE REVIEW ON HYDROPHOBICITY IN CELLULOSIC NATURAL FIBERS: TRENDS, TECHNIQUES, AND FUTURE DIRECTIONS

Prasath, K.; **Senthamaraikannan, P.; Suyambulingam, I.**; Thyavihalli Girijappa, T.G.; Avudaiappan, S.; Selvaraj, R.C.A.

International Journal of Biological Macromolecules

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Abstract

Cellulosic natural fibers have gained significant attention as sustainable and biodegradable alternatives for reinforcing polymer composites and producing environmentally friendly materials. However, their intrinsic hydrophilicity, originating from the abundant hydroxyl groups on the cellulose backbone, poses critical limitations in applications that require water resistance, dimensional stability, and strong interfacial bonding with hydrophobic matrices. This review explores the origin of hydrophilicity in cellulosic fibers and its impact on various applications, including packaging, textiles, and composite reinforcement. Comprehensive strategies to enhance fiber hydrophobicity are examined, including chemical modifications, physical treatments, and surface engineering techniques. Key characterization methods such as contact angle measurement, Fourier transform infrared, scanning electron microscopy, X-ray diffraction, and thermal analyses are discussed to evaluate the effectiveness of hydrophobic modification. Furthermore, the review highlights advanced applications of hydrophobically modified fibers in water-repellent textiles, filtration materials, and moisture-resistant biocomposites. Finally, current challenges such as environmental concerns, mechanical property trade-offs, and scalability are outlined, along with future research directions aimed at developing multifunctional, durable, and eco-friendly fiber systems. © 2025 Elsevier B.V.

Author keywords- Biodegradable composites; Cellulosic natural fibers; Hydrophilicity; Hydrophobic modification; Surface treatment; Sustainable materials

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**92nd**	**8.5**	12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 13 CLIMATE ACTION

RECENT ADVANCES IN MICROCRYSTALLINE CELLULOSE-REINFORCED POLYMER COMPOSITES: EXTRACTION, PROPERTIES, APPLICATIONS, AND SUSTAINABILITY PERSPECTIVES

Narayanaperumal, S.; **Suyambulingam, I.**; Divakaran, D.; **Senthamaraikannan, P.**; Selvan, A.; Avudaiappan, S.; Ayrilmis, N.; Eyupoglu, S.

International Journal of Biological Macromolecules

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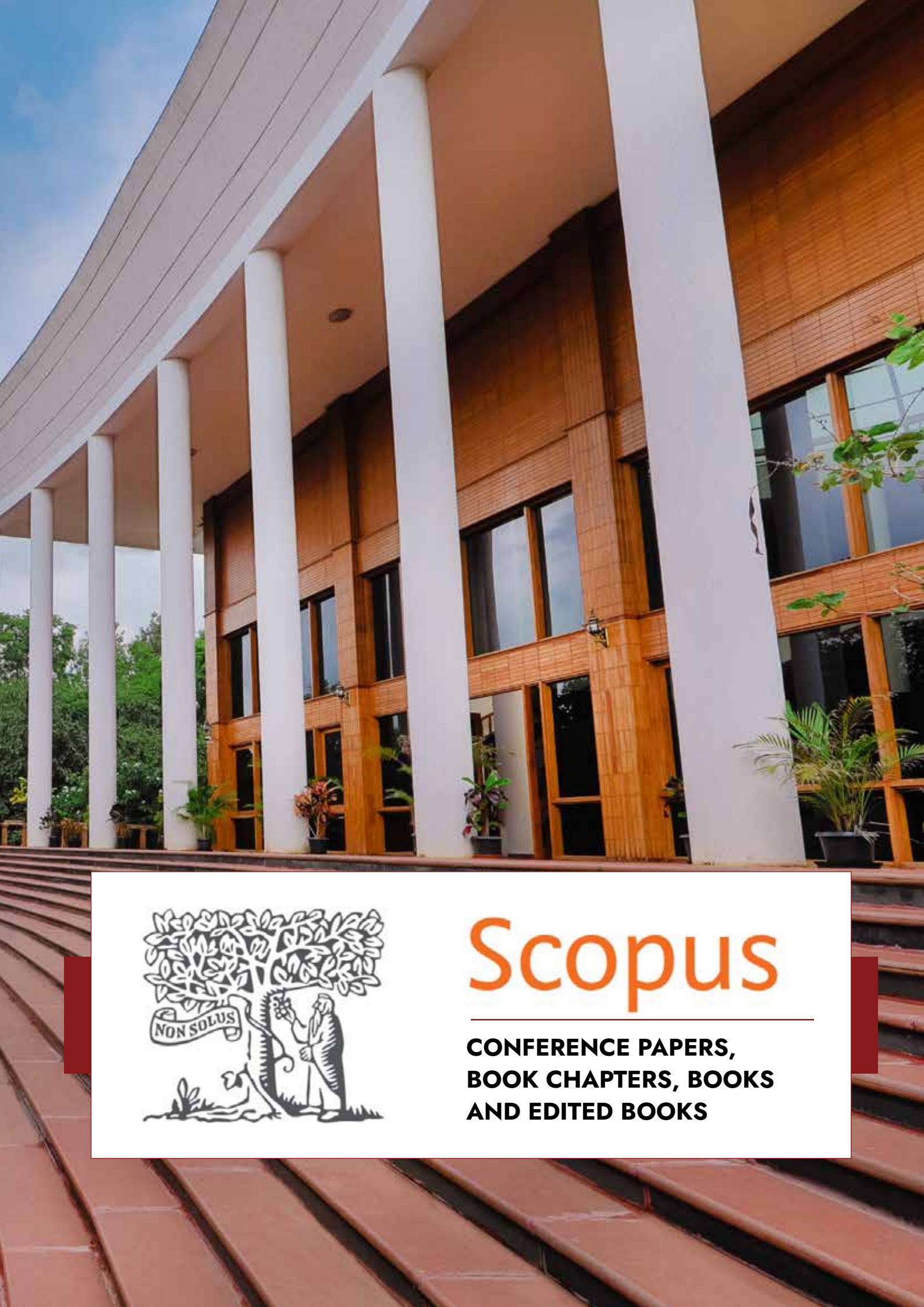
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Abstract

Microcrystalline cellulose (MCC) is a renewable and biodegradable biopolymer that has attracted significant interest as a reinforcing filler in polymer biocomposite films. This review provides a comprehensive overview of MCC-based biocomposites and their impact on film sustainability. It covers MCC sources from agricultural and industrial waste, new extraction processes (e.g., microwave- and enzyme-assisted processes), and environmentally friendly solvents such as ionic and deep eutectic solvents. Alternative fabrication methods, including solution casting, melt blending, and electrospinning were discussed. Furthermore, the impact of MCC on the mechanical properties, thermal resistance, and barrier properties was analyzed. Biodegradation behavior, environmental performance, and new surface modification strategies of MCC were comprehensively discussed. Applications in packaging, biomedical devices, agriculture, and intelligent sensing were emphasized, alongside lifecycle and circular economy considerations. The study concluded with a discussion of the challenges faced and future directions, highlighting the potential of MCC to advance sustainable biopolymer-based technologies.
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Author keywords- Biocomposite film; Microcrystalline cellulose; Sustainable biopolymer



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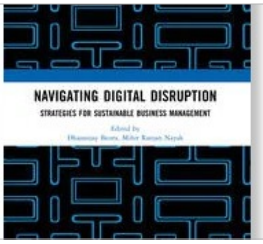
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	08 DECENT WORK AND ECONOMIC GROWTH

DEVELOPMENTAL IDIOSYNCRATIC DEALS: A REVIEW OF PRESENT LITERATURE, RECENT TRENDS AND APPLICATIONS

Jena, B.P.; Mishra, L.; Mishra, S.

Navigating Digital Disruption: Strategies for sustainable business management

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1st Edition

Navigating Digital Disruption: Strategies for sustainable business management

Edited By Dhananjay Beura, Mihir Ranjan Nayak

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Abstract

Purpose: This paper aims to expose the research-practice gap regarding Developmental idiosyncratic deals (D-Ideals) by summarizing existing literature and presenting recent practical advancements through a framework encompassing its causes and consequences. The text outlines the implications for managers regarding the implementation of D-Ideals for the mutual advantage of employees and employers. Design/methodology/approach: This paper provides a study of the evolving topics of D-Ideals for VUCA business world. Findings: This study outlines the prerequisites and potential results for employees who can negotiate D-Ideals. The framework outlines multiple theoretical lenses for understanding the D-Ideal. Originality/value: The framework exhibited in this research is beneficial for managers in implementing D-Ideals within their workplaces. © 2026 selection and editorial matter, Dhananjay Beura and Mihir Ranjan Nayak. All rights reserved.

Author keywords- Bibliometrics; Career; Career management; Development; Developmental idiosyncratic deals; Idiosyncratic deals; Review paper

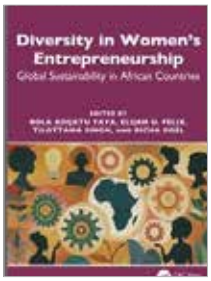
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	05 GENDER EQUALITY, 08 DECENT WORK AND ECONOMIC GROWTH

EMPOWERING CHANGE: THE ROLE OF DIVERSE WOMEN ENTREPRENEURS IN SHAPING AFRICA'S SUSTAINABLE FUTURE

Sahdev, S.L.; Krishnan, C.; Paul, G.W.; Panday, R.

Diversity in Women's Entrepreneurship: Global Sustainability in African Countries

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Alliance School of Business



Abstract

This chapter explores the critical role of diverse women entrepreneurs in driving sustainability across Africa. It examines the intersection of gender, diversity, and entrepreneurship, highlighting how women-led ventures contribute to key sustainable development goals (SDGs). Through real-life examples from sectors such as technology, agriculture, and health, the chapter underscores the innovative and inclusive business models that women entrepreneurs develop. Also, it explores the unique challenges African women entrepreneurs face, from limited access to resources to institutional barriers, and emphasizes the importance of global partnerships and support systems in overcoming these obstacles. Ultimately, the chapter aims to inspire a future where empowered women entrepreneurs lead the charge in fostering sustainable and equitable growth across the continent.
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Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	04 QUALITY EDUCATION, 10 REDUCED INEQUALITIES

EDUCATION FOR SUSTAINABLE DEVELOPMENT AND PSYCHOLOGY OF SUSTAINABILITY: PATHWAYS TO EQUITY, RESILIENCE, AND INCLUSIVE GROWTH

Alam, A.; Mohanty, A.; Prestianawati, S.A.

Smart Technologies for Sustainable Development Goals: Quality Education

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Abstract

This research explores the integration of Education for Sustainable Development (ESD) and the Psychology of Sustainability to address critical global challenges in the 21st century. Rapid economic transformations, systemic shocks like the COVID-19 pandemic, and escalating environmental degradation have disproportionately affected vulnerable populations, including ethnic minorities, women, immigrants, and precarious workers. Grounded in interdisciplinary frameworks, the study highlights the importance of inclusivity, decent work, and resilience in advancing sustainable development. The paper examines the Psychology of Working Framework (PWF) and its potential to reduce systemic disparities by promoting equitable access to employment and psychological well-being. It emphasizes the transformative role of positive healthy organizations, agentic action, and sustainable leadership in creating environments that nurture human dignity and productivity. Furthermore, the paper addresses the impacts of global crises on economic, psychological, and environmental sustainability, emphasizing the need for flexible policies, collaborative efforts, and innovations in workplace dynamics. Additionally, the research explores environmental psychology's contributions to sustainable behaviors and the gendered dimensions of sustainable consumption. It calls for culturally sensitive, systemic interventions to bridge equity gaps and advance sustainability goals. By integrating psychological science, sustainability principles, and policy reforms, this study outlines actionable pathways toward a resilient, inclusive, and equitable future for individuals and societies.
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Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	04 QUALITY EDUCATION; 16 PEACE, JUSTICE AND STRONG INSTITUTIONS

EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) AND GLOBAL CITIZENSHIP

Alam, A.;Mohanty, A.; Bhatnagar, P.

Smart Technologies for Sustainable Development Goals: Quality Education

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Abstract

The convergence of global crises, including the COVID-19 pandemic, climate emergencies, and systemic inequalities, highlights the inadequacies of traditional educational systems to address complex, interconnected challenges. This paper explores the transformative potential of education, emphasizing the integration of Global Citizenship Education (GCE) and Education for Sustainable Development (ESD) as pivotal strategies for nurturing ethical engagement, critical thinking, and practical problem-solving skills. GCE promotes global responsibility and active participation in addressing inequities, while ESD equips learners with the knowledge and values to advance sustainability. Their synergy, rooted in critical praxis, challenges existing educational paradigms and advances action-oriented learning. This investigation digs deep into the imperative of decolonizing education, advocating for the inclusion of diverse epistemologies to address systemic inequities. It emphasizes the role of higher education in bridging theory and practice through innovative methodologies like transgressive learning. Furthermore, non-formal education and community-based approaches are highlighted as essential for inclusivity and equitable access. Examining global and regional contexts, particularly in the Gulf Cooperation Council (GCC) countries, the study emphasizes the integration of sustainability within neoliberal reforms and localized cultural frameworks. The role of AI in advancing SDG-aligned education is also explored, showcasing its potential for enhancing pedagogy and advancing global citizenship. This research calls for collaborative, interdisciplinary efforts to redefine education as a catalyst for societal and ecological transformation.
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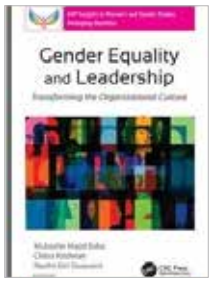
Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	05 GENDER EQUALITY, 08 DECENT WORK AND ECONOMIC GROWTH

INVESTIGATING THE MAIN OBSTACLES FACED BY INDIAN WOMEN IN ACADEMIA WITH WORLDWIDE EXPERIENCE IN ORDER TO ADVANCE THE SDGS FOR GENDER EQUALITY AND DECENT WORK

Sahdev, S.L.; Chotai, N.; Jagadeeswari, I.U.

Gender Equality and Leadership: Transforming the Organizational Culture

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Abstract

This chapter explores the significant challenges women face in pursuing careers in the education sector, both domestically and internationally, with a focus on gender equality and decent work. Interviews with highly qualified women holding prominent academic positions provided valuable insights into their experiences. Qualitative analysis of the data revealed key obstacles, including inflexible employment systems, a lack of gender inclusive policies, and the persistence of traditional cultural norms. These challenges were evident across diverse regions, including India, the United States, the United Kingdom, Canada, France, the UAE, and Australia. Addressing issues of gender equality and decent work from an early stage is critical to enhancing women's participation in education. This is essential for fostering inclusive organizations and achieving sustainable social development. By examining cross-cultural perspectives, the chapter sheds light on strategies to overcome barriers and promote women's engagement in the academic field. It emphasizes the importance of context in understanding and addressing gender inequality, highlighting the need for adaptable solutions that resonate with varying cultural and organizational frameworks. This work contributes to the broader dialogue on creating equitable opportunities for women in education, aligning with goals of inclusivity and sustainable progress. © 2026 by Apple Academic Press, Inc.

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 16 PEACE, JUSTICE AND STRONG INSTITUTIONS

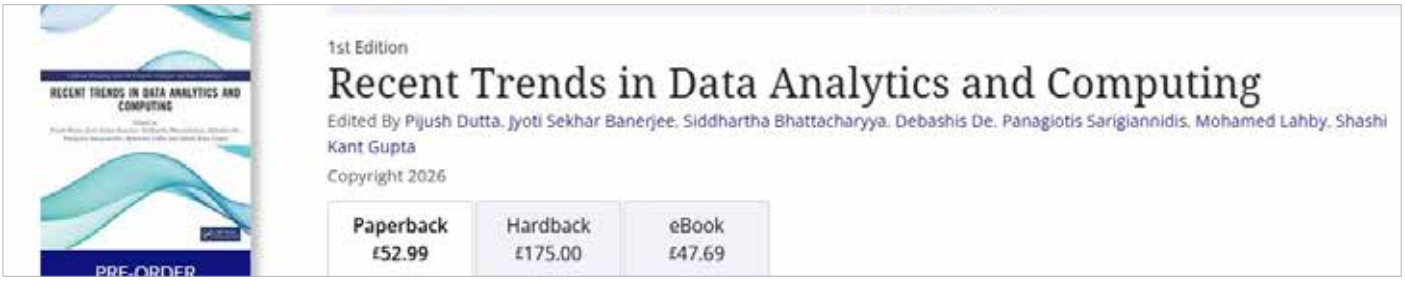
AI-DRIVEN CLOUD SHIELD: A COMPREHENSIVE REVIEW OF MACHINE LEARNING APPROACHES FOR CLOUD CYBER SECURITY

Sathish, K.; **Rajesh Sharma**, R.; Revathi, S.; Venugopal, V.; **Sungheetha, A.**; Premkumar, M.

Recent Trends in Data Analytics and Computing: Exploring Emerging Technologies and Future Directions, A proceeding of ICADAC – 2025

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Abstract

Cloud services have reduced the constraints hindering facile business transactions and processes but the security risks that have followed are significant. Cloud security strategies cannot always rely on conventional security solutions because of the scale and nature of interaction with clouds. This systematic review aims to identify a review of the use of ML in improving cloud security known as the AI-Driven Cloud Shield. It looks at introduced methods of machine learning including supervised, unsupervised and reinforcement machine learning together with the use of threats detection and anomalies identification besides adaptive security. The present systematic review includes more than one hundred papers published in 2019–2023. The study was centered on ML algorithms and practices, their effectiveness in cloud security scenarios as well as trends and developments in AI based cyber security. The subsequent unsupervised analysis shows that ensemble learning approaches and deep neural networks always provide greater threat detection accuracy than conventional baseline ML algorithms, with the accuracy increasing by 15–30%. Clustering techniques exhibit potential in detecting previously unseen attacks while reinforcement learning reveals potential in automating the process of improving security policies. The concept represented by AI-driven Cloud Shield illustrates one of the most radical changes in cloud security. Still, there are some limitations, such as interpretability and adversarial robustness; the application of ML techniques greatly improves the effectiveness of cloud security mechanisms. Other areas of the focus involve applying the concept of FL for secure distribution learning and designing explainable AI (XAI) for compliance with the regulatory requirements.
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Author keywords- Adaptive security; Artificial intelligence; Cloud cybersecurity; Machine learning; Threat detection

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	**NA**	**NA**	



AI-POWERED PRIVACY SHIELDS AND MACHINE LEARNING APPROACHES FOR SECURING DIGITAL MONEY TRANSACTIONS: A SYSTEMATIC REVIEW

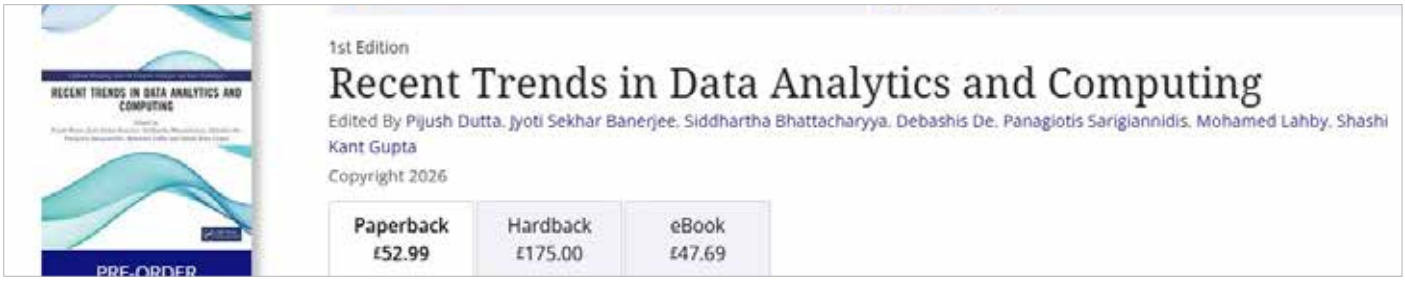
Rajesh Sharma, R.; Sungheetha, A.; Saranya, S.; Venugopal, V.; Priyatharsini, C.; **Ghantasala, G.S.P.**

Recent Trends in Data Analytics and Computing: Exploring Emerging Technologies and Future Directions, A proceeding of ICADAC – 2025

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Abstract

The synergy of artificial intelligence (AI)-based technologies and digital financial transactions require secure anonymized methods while retaining the effectiveness of AI-based fraud-detection. This systematic review investigates stateof-the-art means of enhancing privacy assurance in ML by leveraging innovative schemes to safeguard money transfers in electronic platforms. Many privacy-preserving techniques are available and can be adopted by financial institutions to analyses encrypted data these include homomorphic encryption and federated learning. Employing these methods, AI models can identify fraudulent behavior patterns while at the same time not compromising on the privacy of single transactions. There is an extra level of security or anonymity given x by zero-knowledge proof which allows for the verification of the transactions without disclosing the data behind such transactions. Differential privacy is also used to apply noise on data to ensure that no distinguishing data set is used by the algorithm while ensuring the data is useful for statistical purposes for the ML models used. As much as its integration offers potential in carrying these privacy-shields presents some considerations. Mainly, they improve security and users' confidence but at the same time introduce computation cost and system intricacy. This review therefore looks at different implementation strategies and hybrid solutions which employ several ideas aimed at maintaining high efficiency of the applied privacy-preserving techniques. Security: Advanced developments in hardware acceleration and algorithms have brought into use these methods nearer to real life applications. It also explores areas of future development including quantum protection of privacy and privacy preserving AI systems. Nonetheless, time and again there are instances where researchers experienced difficulties in the actual implementation such as the approaches may not be scalable, in other words may not well work for large data sets, or that there is need to standardize these models for privacy-preserving AI to be well embraced as it remains one of the most important revolutions by which the safety of financial systems in the digital world can be enhanced. As trading volumes increase and the regulation of how clients' data is used gets stricter, these technologies will be at the heart of shielding consumer information whilst facilitating enhanced fight against fraud.

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Author keywords- Differential privacy; Federated learning; Homomorphic encryption; Privacy-preserving artificial intelligence; Zero-knowledge proofs

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q2	**53rd**	**0.60**	16 PEACE, JUSTICE AND STRONG INSTITUTIONS

CARTELS IN CRISIS MANAGEMENT: AN ANALYSIS OF THE US ANTITRUST LAW ON CRISIS CARTELS WITH SPECIAL REFERENCE TO THE COVID-19 PANDEMIC

Kushwaha, A.; Shaw, R.

Studies in Systems, Decision and Control

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Abstract

The United States' antitrust jurisprudence has historically maintained an unequivocal stance against horizontal agreements, reflecting deep-seated public and legislative antipathy toward cartelization. The unprecedented scale of the COVID-19 pandemic, however, has catalyzed a subtle yet significant shift in this established doctrine. The extraordinary challenges posed by the global health crisis necessitated novel approaches to market cooperation, compelling U.S. antitrust authorities to recalibrate their traditional stance toward competitor collaborations. This emergent phenomenon of 'crisis cartels'—temporary collaborative arrangements among competitors during periods of acute market distress—presents a fascinating intersection of public health imperatives and competition law principles. This article presents a comprehensive analysis of the U.S. antitrust framework's treatment of crisis cartels, examining the legislative foundation, judicial interpretation, and regulatory guidance that shape their legitimacy under exceptional circumstances. Through systematic examination of historical precedents and contemporary developments during the COVID-19 crisis, this study illuminates the emerging doctrinal flexibility while critically evaluating its implications for future antitrust enforcement. The analysis contributes to the scholarly discourse on the intersection of competition law and crisis management, offering insights into the delicate balance between maintaining competitive markets and addressing unprecedented public health emergencies.
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Author keywords- Antitrust; Cartelization; Competition; Covid-19; Crisis cartel

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	08 DECENT WORK AND ECONOMIC GROWTH

PURCHASE AND SALES OF LIFE INSURANCE SCHEMES: EVIDENCE FROM EAST INDIA

Mondal, S.S.

Strategies for Sustainable Growth in Modern Organizations

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Alliance School of Economics



Abstract

In this paper, we document the patterns of holdings of insurance products of mainly two types, traditional life insurance policies Unit Linked Insurance Plans (ULIPs). We describe the mechanism of selling of such products to Indian consumers, highlighting the role of insurance agents. Using a proprietary data from the sales of insurance policies by an IRDAI authorized intermediary of a reputed insurance company, we analyse the distinctive features of sales of insurance products in rural and semi-urban area among poor to middle class investors in Eastern India during 2008 to 2013, a period when the mis-selling of such products was especially rampant. We also analyse the distribution of policies of two broad types. We look at characteristics of consumers purchasing either type of plan and the determinants of purchase of such plans using econometric models. In addition, we investigate incentive structures of agents in selling such policies. Specifically, we investigate the allegedly unethical sales of ULIP policies by agents, prompting a change in commission structure of such products by the IRDAI. Finally, we investigate the subsequent evolution of policy and its impact on life insurance sales in India, highlighting issues of sustainability of business practices.
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Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q2	**53rd**	**0.60**	08 DECENT WORK AND ECONOMIC GROWTH

ETHOS OF KNOWLEDGE CREATION CULTURE IN MANIFESTATION OF KNOWLEDGE REINFORCEMENT

Bi, A.; **Verma, P.**

Studies in Systems, Decision and Control

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Abstract

Knowledge is a universal phenomenon. Human from every occupation own subjective and objective knowledge, put together formulates a novel knowledge. Organisations face intricacy in introducing new knowledge to achieve the pleasures of successful workplace and managing the knowledge of the knowledge workers is the biggest challenge in this new era. The aim of the study is to address the key dilemma of organisations in strengthening the knowledge creation culture in manifestation of knowledge reinforcement. We developed a abstractive notion based on the literature in the arena of knowledge management to aid the organisations in formulating a better perspective on knowledge creation supremacy. Exclusively screening of knowledge creation by employees is the imperative aspect for organisations to leverage, enhance and sustain knowledge reinforcement and this viewpoint is away in many theories of the learning organisation. The conceptual model concentrates on the supremacy of knowledge creation rejuvenating the other elements of knowledge management. We further develop the model to study the affect of organisations' absorptive capacity as the key moderator which strengthens the state between the elements of knowledge management and knowledge reinforcement. The future scope of the study entails organisations to shape the culture of knowledge management with a constructive notion that knowledge reinforcement reforms the spiral of knowledge management elements.
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Author keywords- Employees' subjective knowledge; Knowledge creation organisations' absorptive capacity; Knowledge reinforcement; Objective knowledge

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q4	**7th**	**0.25**	03 GOOD HEALTH AND WELL-BEING; 08 DECENT WORK AND ECONOMIC GROWTH

ROOT CAUSE ANALYSIS OF UNDERGROUND MINES ACCIDENT USING BAYESIAN NETWORK MODEL

Sahu, A.R.; **Prakash, S.**; Kashi, V.K.

Springer Proceedings in Earth and Environmental Sciences

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Alliance School of Applied Engineering

SPRINGER NATURE Link



Book series

Springer Proceedings in Earth and Environmental Sciences

Abstract

The mining industry has a high fatality rate and a number of non-fatal accidents that make it one of the most hazardous occupations in the world. These accidents often result in deaths, injury, destruction of machinery, and directly impact the productivity of the mines. Therefore, prediction of root cause of these accidents is crucial to take appropriate preventive action plan. In this study, the probabilistic relationship among the accident root causes, effects of accidents, and some additional parameters are developed using Bayesian network (BN) model and construct the conditional probability table (CPT). We consider 224 accidents cases which occurred in Indian underground mine from 2010 to 2023. The three-axiom based sensitivity analysis is used to validate the developed BN model as well as identify the most sensitive parameter that are responsible of the occurrence of accident. Additionally, the proposed research work will help us to develop an intelligence decision support system for safety governance and identify root causes to improve mine monitoring and safety.
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Author keywords- Bayesian network; Mine safety; Root cause analysis; Sensitivity analysis; Underground mine accident

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q4	**21st**	**0.51**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

IMPLEMENTING STRIPS PLANNER FOR AUTOMATED TASK SCHEDULING

Babu, T.; Tupkary, A.V.; Akash, S.; Renjith, R.K.; Abhijith, M.; **Nair, R.R.**

Smart Innovation, Systems and Technologies

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Book series

Smart Innovation, Systems and Technologies

Abstract

Task scheduling is a significant challenge within the field of artificial intelligence due to its relevance to many areas such as robotics, logistics, and workflow management. The current paper describes the building of Stanford Research Institute Planning System (STRIPS) based planner for the purposes of task scheduling. Planning as a concept consists of actions or tasks that have a defined precondition and an effect, thus, making it possible to break down any complex scheduling problems into simpler multi-level ones. The first step is to transform the practical scheduling problems into STRIPS task geometrical structure, showing resource constraints, tasks relationships and the objective. The planner then produces a series of actions that meet the stated objectives within the given constraints in the most efficient manner. Evidence shows that the STRIPS planner is capable of handling scheduling problems and it is also efficient in terms of varying the size and complexity of the problems that it can solve.This study provides evidence for the use of STRIPS-type planners in intelligent automation, which is the missing link between planning decomposition concepts and the available equipment. The results offer positive perspectives for future research on enhancing the efficiency of the planning process and adapting the model for dynamic and probabilistic scheduling problems.
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Author keywords- Gantt chart; heuristics; Naturalistic decision making; Planning Domain Description Language (PDDL); Scheduling; State space search; STRIPS planner

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

A SOLUTION TO FUSCHIAN DIFFERENTIAL EQUATION HAVING FIVE SINGULAR POINTS

Shukla, B.; Shukla, V.; Malik, S.; **Yadav, S.**

Lecture Notes in Networks and Systems

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Abstract

Generalized Heun-type differential equation appears in the study of quantum systems, particularly in the calculation of energy levels and wave functions. A particular case of generalized Heun type differential equation is solved using a special approach called tridiagonal representation approach. The differential equation has five singularities: four regular and one irregular at infinity. The differential equation is solved in terms of Jacobi polynomials in a series. This series' expansion coefficients fulfill a three-term recurrence relation, so forming a new class of orthogonal polynomials.
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Author keywords- BDifferential equation; Orthogonal polynomials; Recurrence relation; Special function; Tridiagonal representation

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	03 GOOD HEALTH AND WELL-BEING

OPIOID DISEASE MORTALITY RATE ANALYSIS IN UNITED STATES USING AI

Yadav, S.; Kumar, S.; Sakshi; Aaryan

Lecture Notes in Networks and Systems

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Abstract

Artificial Intelligence (AI) is revolutionizing healthcare by enhancing diagnostics, optimizing treatment plans, and enabling data-driven public health strategies. This paper focuses on the application of AI to combat the opioid overdose crisis in the United States, utilizing machine learning techniques—particularly reinforcement learning—to inform policy interventions. We explore the use of deep Q-networks (DQN) trained on CDC opioid mortality data to simulate optimal intervention strategies across states, demonstrating a potential reduction of 15% in projected deaths. Additionally, we apply clustering and trend analysis on multi-year overdose data to uncover regional dynamics and emerging hotspots. The study also examines key ethical considerations, data privacy solutions, and integration challenges within AI-driven healthcare systems. By combining algorithmic insights with epidemiological realities, this work offers a scalable and explainable AI framework to support equitable healthcare policy design.
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Author keywords- Deep Q-Networks; Healthcare; Machine Learning; Opioid Overdose; Predictive Analytics; Public Health Policy; Reinforcement Learning; Trend Analysis

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	

REAL-TIME ANOMALY DETECTION IN SMART ENERGY SYSTEMS USING STATISTICAL AND ADAPTIVE LEARNING TECHNIQUES

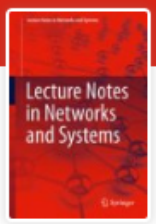
Maitra, S.; Arora, K.; Kundu, S.

Lecture Notes in Networks and Systems

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Book series

Lecture Notes in Networks and Systems

Abstract

The rapid proliferation of smart meters in residential and commercial buildings has led to the generation of vast amounts of energy consumption data. Detecting anomalies in this data is critical for identifying abnormal energy usage patterns, preventing potential system failures, and promoting energy efficiency. In this study, we propose a statistical anomaly detection framework that integrates Exponentially Weighted Moving Average, Quantile Regression, and Adaptive Drift Detection Method to detect point anomalies in hourly energy consumption data over a year-long period. The proposed method is computationally efficient and interpretable. The findings highlight the effectiveness of this lightweight and scalable approach for real-time energy anomaly detection.
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Author keywords- Adaptive learning; Anomaly; Dynamic threshold; Statistical model; Sustainability

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	16 PEACE, JUSTICE AND STRONG INSTITUTIONS

USER DATA ANALYTICS FOR PREDICTION OF BUSINESS IMPACT DUE TO CYBERCRIMES IN INDIA: LEARNINGS FROM LITERATURE AND METADATA

Khuntia, D.; Chowdhury, A.; Chakraborty, S.

Lecture Notes in Networks and Systems

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Abstract

Cybercrime poses a significant threat to India's business environment, disrupting economic ecosystems, revenue growth, innovation, and employee well-being. As digital adoption accelerates, sectors like banking, e-commerce, and manufacturing face escalating vulnerabilities. This study analyses cyber crime's multifaceted impact, revealing projected losses of 20,000 crore in 2025, with banking (8,200 crore) and retail (5,800 crore) hardest hit. Beyond financial damage, attacks erode trust, delay deliveries (30% of manufacturers), and slow AI/cloud adoption (40%). Intellectual property theft affects 22% of firms, while SMEs struggle with weak defences (73% prioritize cybersecurity). Employees face data breaches (32% via PUPs) and stress (45%). The paper advocates for stronger policies (e.g., enhancing I4C), AI-driven security, and workforce training to build resilience. A holistic approach—combining regulation, public-private collaboration, and awareness—is critical to safeguarding India's digital economy.
© The Author(s), under exclusive license to Springer Nature Switzerland AG 2026.

Author keywords- Business loss; Cybercrimes; Cybersecurity; Data Analytics; Predictive Analysis

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	16 PEACE, JUSTICE AND STRONG INSTITUTIONS

COMPREHENSIVE WEB SERVICE SECURITY AUDIT AND DATA CONCEALMENT USING ADVANCED VULNERABILITY DETECTION AND STEGANOGRAPHY TECHNIQUES

Rani, E.; Naik, L.; Hemalatha, P.; Mahi, R.; Ramakalyani, K.; Gurusneha, B.

Lecture Notes in Networks and Systems

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Abstract

The study addresses the aspect of the web service that can withstand a DoS or DDoS attack. Most of the tests yielded many high-level vulnerabilities, including but not limited to joint password enforcement, less secure configurations, and exposure of software vulnerabilities. Different research recommended considering one or more defense layers to alleviate these issues. The exercise recommended improvement with respect to sound password policies, secure configuration server-based, and patching towards vulnerability correction. Besides, emphasis has also been laid on reliable backup processes, safe configurations, and safe integration of application data. Steganographic application employs means of hiding sensitive data within images, which shows an interesting but hidden alternative means of ensuring maximum sanctity about extremely sensitive communications. This paper's output can serve as a guideline to inspire organizations into preemptively acting to safeguard their interests concerning their web resources. State-of-the-art documentation of tools, methodologies, and findings will be interpreted as a valid framework for conducting a security assessment study. Reveal flaws in the code during source code examination and test runtime behaviors to capture vulnerabilities both pre-deployment and runtime. Advanced SSL/TLS Configuration Scanning Tools: SSLyze, testssl.sh, Qualys SSL Labs API. Detection Includes: Weak cipher suites (RC4, DES); Improper certificate chains; Memory leak-like defects (Heartbleed). Container and CI/CD Pipeline Scanning Tools: Trivy, Clair, Anchore. Purpose: To find vulnerabilities in Docker images, Kubernetes configurations, and GitHub workflows.
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Author keywords- K means clustering; Security Audit Tools; SSL/TLS encryption; Threat Analysis; Vulnerability Scanning; web service security

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

TEMPORAL PATTERN RECOGNITION IN IOT SENSOR STREAMS USING SPATIO-TEMPORAL REASONING

Pradeep, G.G.S.; Kolla, T.; **Sharma, R.R.; Sungheetha, A.; Vijayalakshmi, N.**; Vidyullatha, P.

Lecture Notes in Networks and Systems

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Abstract

The ever-increasing implementation of IoT sensor networks in smart environments has created a multitude of multivariate spatio-temporal data streams. The effective identification of temporal patterns and anomalies in those streams becomes necessary to ensure environmental awareness and operational integrity. This paper proposes an elaborate framework for temporal pattern recognition in IoT sensor data through the integration of spatio-temporal reasoning, statistical modeling, and anomaly detection. The approach uses statistical descriptors, kernel density estimation, correlation matrices, and spatio-temporal visualization to capture local anomalies as well as trends prevalent in aggregation over distributed sensors in order to illustrate its strengths in analyzing the data. One of the case studies depicts the environmental awareness based on monitoring temperature: deviation detection, inter-sensor coherence, and a conceptual view of anomaly propagation. The results indicate the potential of establishing a system capable of real-time and interpretable monitoring in dynamically evolving IoT settings. This work contributes toward more adaptive and transparent sensing architectures capable of operating under uncertainty and environmental variability. The abstract is coherently structured, flowing from motivation to case study, methodology, results, and contribution. It also accurately frames the rationale for the study and successfully defines the fundamental difficulty in IoT sensor networks, which is the recognition of temporal patterns and abnormalities.
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Author keywords- Anomaly detection; Environmental monitoring; Inter-sensor correlation; Kernel density estimation; Real-time analysis; Recognition of temporal patterns; sensor streams from IoTs; Spatio-temporal reasoning

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	03 GOOD HEALTH AND WELL-BEING

PRODUCT MARKET RESPONSE EVALUATION APPLYING USER DATA ANALYTICS: A STUDY ON BREAST FEEDING EQUIPMENT

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Lecture Notes in Networks and Systems

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Abstract

This study explores the product-market response to breastfeeding equipment by leveraging user data analytics to evaluate consumer behavior, preferences, and satisfaction. As maternal health awareness grows and parenting practices evolve, breastfeeding products have seen significant innovation in design, functionality, and accessibility. However, market success relies not only on product features but also on understanding real-world user experience and response. The research employs a quantitative method, from user ratings sales metrics to get insights from data collected from amazon.in. Findings reveal key determinants influencing user acceptance, including ergonomic design, portability, ease of use, and aesthetics. The study also identifies gaps between user expectations and product performance that affect repeat purchases despite of product brand. By contextualizing user experience data within broader market trends, the research highlights the role of user-centered design and feedback loops in enhancing product relevance and competitiveness. The outcomes of this study can inform product developers, marketers, and health professionals in creating more effective, user-aligned breastfeeding solutions that support maternal well-being and infant health outcomes.
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Author keywords- : Aesthetics; Behavior; Design; Functionality; User Experience; User-centered design

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	08 DECENT WORK AND ECONOMIC GROWTH; 09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

FUTURE OF MSMES IN THE DIGITAL AGE: CHALLENGES AND OPPORTUNITIES IN DEVELOPING COUNTRIES

Deepa Raj, O.K.; **Shyam Kishore, V.**

Lecture Notes in Networks and Systems

Dr. V. Shyam Kishore
Professor
Alliance School of Law



Abstract

The present digital world marks the Micro, Small and Medium Enterprises (MSMEs) the backbone of developing country's economy. MSMEs contribute largely towards employment and GDP. The digital age has alarmingly reshaped the global markets posing both challenges and opportunities for MSMEs, thereby shaping their future in unprecedented ways. The prospects of digitalization paves way for the small businesses to access global markets, improve efficiency and enhance customer engagement through e-commerce, fintech solutions, AI and cloud-based technologies. Platforms like Amazon, Flipkart and ONDC provide MSMEs in various sectors of manufacturing, services, agriculturally based, trade and retail with opportunities to expand their business beyond local markets. However, MSMEs in developing countries face significant barriers to digital adoption in conduct of their business, including limited internet access, lack of digital literacy, cybersecurity risks and inadequate financial support. Besides, many small businesses struggle with high cost of technology, unreliable infrastructure and resistance to change. Governments and policymakers play a major role bridging this gap through digital training programs, infrastructure development and financial incentives. The future of MSMEs in the digital economy depends largely on their ability to innovate and adapt. Lastly, financial inclusion with right policies enables MSMEs to access credit, digital payment, banking services in digital age fostering sustainable growth, employment opportunities and economic resilience in developing countries.
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Author keywords- Developing countries; Digital age; Financial inclusion; MSMEs

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

NOVEL ADAPTIVE TEMPORAL GRAPH LEARNING FRAMEWORK WITH EMBEDDINGS AND ATTENTION MECHANISMS FOR ENHANCED PREDICTIVE ACCURACY

Babu, T.; Nair, R.R.; Balusami, B.; Khan, F.

Lecture Notes in Networks and Systems

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Alliance School of Advanced Computing

Dr. Rekha R Nair
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Abstract

Temporal graphs play a crucial role in modeling evolving relationships across domains such as social networks, financial transactions, and healthcare systems. This research presents an innovative temporal graph learning framework that combines evolving node embeddings with a flexible attention mechanism to effectively model time-sensitive interactions. The proposed method demonstrates superior performance in terms of predictive accuracy and adaptability when compared to conventional techniques. Experimental results reveal a 15% increase in accuracy and a 30% reduction in computational overhead relative to baseline models such as recurrent neural networks and traditional graph neural networks. Moreover, the framework shows enhanced resilience to incomplete data, improving efficiency by 20% in sparse data scenarios. These advancements contribute to more reliable applications in event prediction, fraud detection, and anomaly recognition, ultimately supporting better decision-making across sectors like finance, healthcare, and cybersecurity.
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Author keywords- : Adaptive Embeddings; Attention Mechanisms; Dynamic Network Analysis; Predictive Analytics; Temporal Graph Learning

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**23rd**	**0.36**	03 GOOD HEALTH AND WELL-BEING

A FRAMEWORK FOR MENTAL HEALTH DETECTION IN TEENAGERS FROM ONLINE SOCIAL NETWORKS

Rohan, R.; **Kurian, A.**; Marx, K.L.

Lecture Notes in Electrical Engineering

Dr. Asha Kurian
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Abstract

The high prevalence of mental illnesses in adolescents makes it crucial to design innovative ways to identify and intervene at an early stage. This paper presents a new framework based on Bidirectional Encoder Representations from Transformers to detect potential mental health risks of teenagers from their online social network activities. The framework captures the subtle linguistic nuances used by teenagers experiencing mental health struggles. This is achieved by fine-tuning a BERT-based sequence classification model on a large dataset of social media posts, categorized across multiple mental health conditions, with the intent of proactive identification of at-risk teenagers. It presents an evaluation of this model, developed using a stratified k-fold cross-validation approach, scoring an average accuracy of 81.42%, precision of 81.98%, recall of 81.49%, and F1-score of 81.42%. The research is thus important for the field of artificial intelligence in mental health screening and points toward strong potential for natural language processing to help better refine early intervention strategies for adolescent mental health. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2026.

Author keywords- Mental Health; Natural Language Processing; Transformers

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**23rd**	**0.36**	08 DECENT WORK AND ECONOMIC GROWTH

AN EFFICIENT ARTIFICIAL INTELLIGENCE BASED MODEL FOR TOURISM RECOMMENDATION

Tomar, A.; **Shukla, A.**; Shukla, D.; Jain, P.; Kamboj, P.; Gupta, V.K.

Lecture Notes in Electrical Engineering

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Abstract

This research article offers new recommendations aimed at improving travel planning using two different methods, including recommendations based on free questions and relevant comments on previously visited places. The system incorporates innovations in various areas, including artificial intelligence, natural language processing and interaction partner filtering to provide useful and relevant recommendations to passengers. In the first method, the system uses integrated tools to recommend places that match the customer's interests by analyzing the user's behavior and preferences in past trips. The second approach uses natural language processing algorithms to understand user input for free questions to provide more accurate and personalized recommendations. Additionally, the system uses technology to continually learn and adjust user recommendations so that recommendations can be continually improved to meet people's needs over time. The conclusion of this article provides recommendations for the implementation and development of these recommendations in the travel and tourism industry, revealing their potential to improve the booking process and improve the overall tourist experience. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2026.

Author keywords- : Artificial intelligence; collaborative filtering; free text query; natural language processing; recommendation system

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	02 ZERO HUNGER

OPTIMIZING PLANT DISEASE DETECTION WITH A NOVEL DEEP ENSEMBLE FRAMEWORK

Beri, R.; **Sachdeva, P.**

Lecture Notes in Networks and Systems

Ms. Parul Sachdeva
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Alliance School of Design



Abstract

Plant diseases present a serious threat to all forms of life. Early detection is vital, which allows farmers to take prompt action, improving both their response and productivity. Our research centers on 5 main rice leaf diseases: bacterial leaf blight, leaf blast, brown spot, leaf scald, and narrow brown spot, along with a category for healthy leaves. Additionally, we examine two types of betel leaves categorized as healthy and unhealthy. This study proposes an innovative deep ensemble model that combines the EfficientNetV2L, InceptionResNetV2, and Xception architectures. This model addresses issues of underfitting and performance by utilizing advanced techniques, including Global Average Pooling, L2 regularization, data augmentation, batch normalization, preprocessing, dropout, PReLU activation, and multiple dense layers. This robust approach surpasses existing models by managing both underfitting and overfitting, while delivering superior performance. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2026.

Author keywords- Belet plant disease; Deep learning; Ensembling technique; Plan disease detection; Rice plan disease

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	04 QUALITY EDUCATION; 08 DECENT WORK AND ECONOMIC GROWTH

DATA-DRIVEN INSIGHTS FOR ENHANCING FINANCIAL WELL-BEING AMONG COLLEGE STUDENTS

Kumar, V.; Kumar, S.; Malik, S.; Shukla, S.

Lecture Notes in Networks and Systems

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Abstract

The financial literacy level of college students in Nagpur city is checked with the help of a questionnaire-based survey. An intervention is then carried out to enhance their financial knowledge. Pre- and post-intervention analysis is carried out using statistical tests. Data and statistics showed that the intervention proved helpful in enhancing the financial education of students. Limitations and future prospects are also outlined. The intervention significantly enhanced financial literacy, with volunteers' knowledge scores increasing from 2.25 out of 3 (75% correct) to 4.3 out of 5 (86% correct; $p < 0.01$), representing an 11-percentage point improvement. Confidence in financial decision-making also improved markedly (Cohen's $d = 1.5$), with strong intentions to adopt positive financial behaviours post-intervention.
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Author keywords- Financial well-being; Questionarre; Survey; T-test

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	02 ZERO HUNGER, 03 GOOD HEALTH AND WELL-BEING

INTEGRATING EDGE-CLOUD COMPUTING AND IOT FOR REAL-TIME FOOD QUALITY ASSESSMENT

Beri, R.; **Sachdeva, P.**

Lecture Notes in Networks and Systems

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Abstract

The advent of IoT technology has significantly transformed the industrial sector, paving the way for the emergence of Food Industry 4.0. This research explores the integration of edge–cloud computing and IoT to create a smart framework tailored for the food industry. Central to this framework is the application of a Bayesian belief network (BBN) on an edge–cloud platform, enabling data-driven insights into food quality. The framework assesses data to calculate the Probability of Food Quality (PFQ) and utilizes the Food Quality Analysis Measure (FQAM) to evaluate food outlets. A bi-level decision tree model further enhances the evaluation process by providing an in-depth analysis of food quality metrics. To address concerns around data security, blockchain technology is implemented, ensuring the protection of food-related information. The model is rigorously tested on a comprehensive dataset encompassing 43,520 instances from four restaurants. Simulation results highlight its high performance, achieving a temporal delay of 96.43 s, and the system demonstrates an accuracy of 98.93%, showcasing its robustness in real-world applications.
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Author keywords- Food quality monitoring; IoT-enabled food industry; Smart food monitoring

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	08 DECENT WORK AND ECONOMIC GROWTH

CREATING A SUSTAINABLE FUTURE BY PREVENTING CUSTOMER CHURN IN E-COMMERCE - A COMPARISON OF MACHINE LEARNING MODELS

Sengupta, S.; Sultana, A.S.; **Bhattacharjee, M.; Hameed, A.**

Lecture Notes in Networks and Systems

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Alliance School of Business

Dr. A Abdul Hameed
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Abstract

The e-commerce industry faces a challenge in retaining its customer base due to cut-throat competition from multiple players and promotional offers. Today's customers have plenty of options to choose from local as well as international players. This paper tries to explain the machine learning model to predict and prevent customer churn, thus improving sustainable practices for the e-commerce industry. Using the artificial neural network (ANN) model and other machine learning (ML) models, the current paper proposes to examine how customer churn prediction can be performed with the best accuracy. Preventing churn will lead to improved customer experience, less usage of financial resources, and better sustainable practices. The paper analyzed 11,260 e-commerce customer data published in credible sources. Multivariate analysis and ML models in Python have been used to find customer trends and prediction modelling. The study showed that demographic factors play an important role in churn. An active customer base, user-friendly mobile applications, e-payment or card usage, and high service scores ensure less customer churn. While predicting customer churn, 19 ML models were executed and the ANN model with multiple hidden layers (100,100,100,100) gave the perfect precision, recall, accuracy and F1 score. Managerial implications were discussed. The improvement and future research areas have also been mentioned. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2026.

Author keywords- Artificial neural networks; Customer churn; E-commerce; Machine learning; Prediction modelling; Sustainable future

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**22nd**	**0.62**	10 REDUCED INEQUALITIES

MULTILINGUAL REAL-TIME SIGN LANGUAGE TRANSLATION: ENABLING CROSS-CULTURAL COMMUNICATION WITH AI

Swetha, C.B.; Nikilesh, B.S.; Sai, B.C.; Gaganashree, S.; Reddy, P.Y.

Lecture Notes in Networks and Systems

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Alliance School of Advanced Computing



Abstract

Communication limitations among the deaf/tough-of-hearing network and the listening to population stay a tremendous assignment. Traditional methods of sign language interpretation require professional human interpreters, which can be costly and logistically tough. This paper gives real translate, an artificial intelligence (AI) powered system that provides real-time translation among spoken languages and sign languages.
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Author keywords- Accessibility; Artificial intelligence (AI); Real translate; Real-time translation; Sign language

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	**23rd**	**0.36**	

REVOLUTIONIZING MICROGRID OPTIMIZATION: THE POWER OF META-HEURISTIC ALGORITHMS IN ADDRESSING OPERATIONAL CHALLENGES

Swetha Shekarappa, G.

Lecture Notes in Electrical Engineering

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Abstract

Microgrids, or MGs, use renewable energy sources to provide the increasing need for energy. On the other hand, operational issues come from intermittent renewables and low power quality. To solve these problems, heuristic optimization strategies have been created by researchers. However, addressing different operational parts of MG is challenging due to mistakes in non-linear and nonconvex optimization induced by local minima and the inability of heuristic approaches to attain a global minimum. The importance of meta-heuristic optimization algorithms (MHOAs) in enhancing MG operational performance is reviewed in this work. The principles of MG optimization are covered, together with current developments in load forecasting, MG techno-economic analysis, resilience enhancement, and energy management. Nearly 25% of research uses particle swarm optimization, while 10% and 5% use genetic and grey wolf algorithms. According to this outcome, MHOA offers a system-agnostic optimization strategy that opens up new possibilities for raising the efficacy of MGs in the future. Lastly, we draw attention to a few difficulties that arise when integrating MHOAs into MGs, which may inspire more study in this field. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2026.

Author keywords- Energy storage; Meta-heuristic optimization; Microgrid; Optimization; Renewable energy

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	23rd	0.36	07 AFFORDABLE AND CLEAN ENERGY

FUZZY-BASED CONTROL TECHNIQUES FOR VOLTAGE REGULATION IN DC MICROGRIDS WITH NONLINEAR LOAD DYNAMICS

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Lecture Notes in Electrical Engineering

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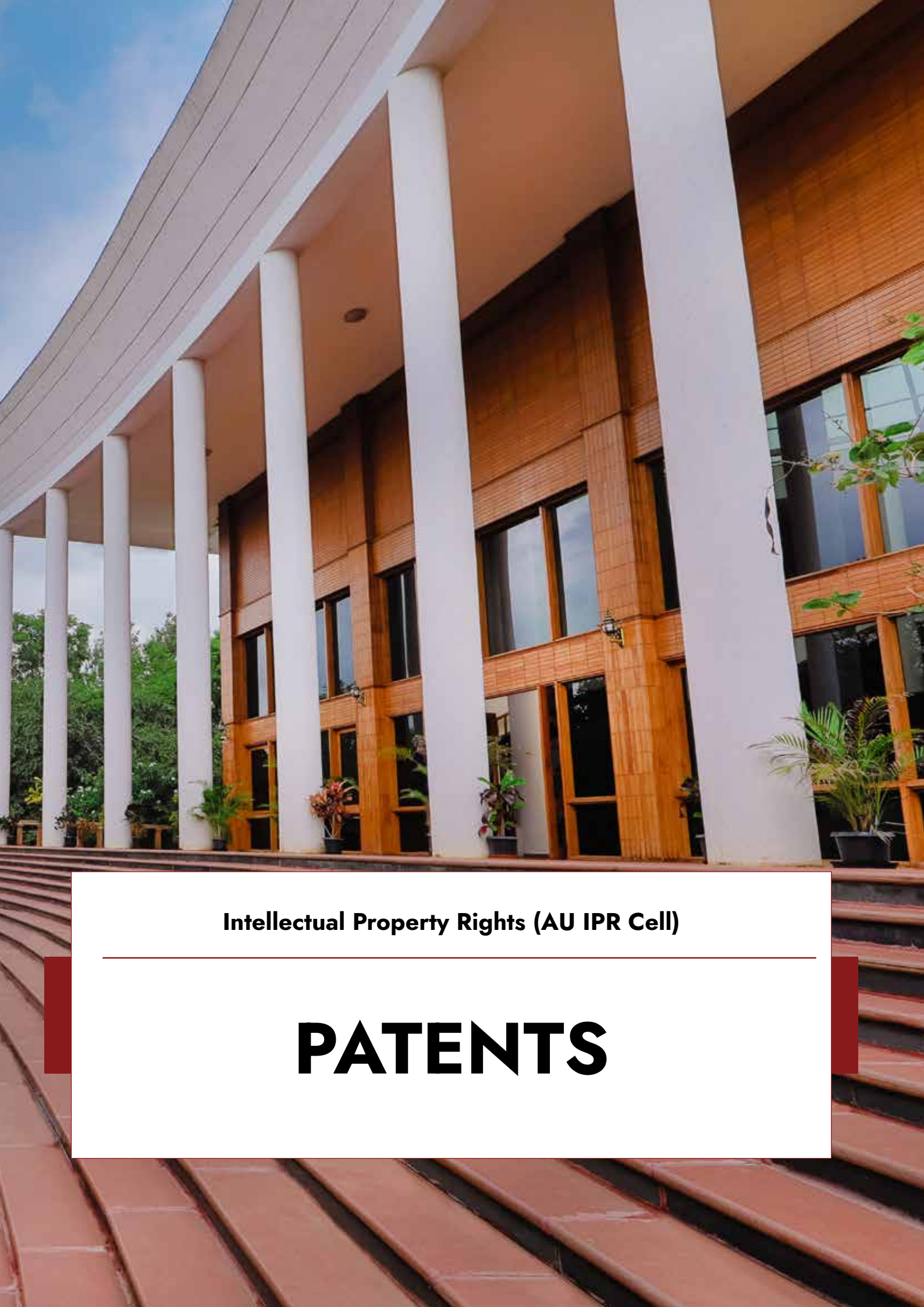


Abstract

Renewable energy technology has led to the widespread adoption of DC microgrids, particularly for their environmental and resilience. DC microgrids offer higher efficiency in applications like electric vehicles and spacecraft due to reduced interface converters and the absence of reactive current. However, they face challenges regulating DC link voltage and ensuring proper current sharing among diverse sources and loads. One major obstacle to these microgrids' ability to regulate voltage is the existence of nonlinear constant power loads (CPLs). DC microgrid performance can degrade because of constant power load (CPL) dynamics. By using fuzzy-based control strategies, this research suggests a novel way to deal with this problem. The research identifies voltage fluctuations, describes the nonlinear behavior of CPLs in DC microgrids, and develops a fuzzy logic controller to control system voltage under various load scenarios. By utilizing fuzzy sets and linguistic rules, the fuzzy controller efficiently reduces overshoot and responds more quickly than conventional techniques to the voltage fluctuations caused by CPLs. In this paper, a fuzzy controller is suggested to deal with the effects of CPLs during transients. The suggested approach is simulated with a DC microgrid feeding two CPLs. The simulation is done in MATLAB/SIMULINK and the results program that the suggested fuzzy-based controller can stabilize a DC microgrid faster in comparison with the conventional PI controller during transients. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2026.

Author keywords- Constant power load; Converters; DC microgrid; Fuzzy control; Renewable energy sources





Intellectual Property Rights (AU IPR Cell)

PATENTS

Application No **202511110767**

Title of the invention

AI AND MACHINE LEARNING-BASED PREDICTIVE SYSTEM FOR EARLY DETECTION, CLASSIFICATION, AND GROWTH PREDICTION OF CANCER CELLS USING BIOMEDICAL IMAGING

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Name of Inventor

Pradeep Kumar Tiwari, Dr. Sandeep Dongre, Dr. Harmanpreet Kaur, Ashlin Jenitha J R, Mr. CH. Kodanda Ramu, Preetham Puneeth Munipalli, Kalaivani. V, Donthala Kumari Kavitha, Dr. Kanchan Koul, Paindla Thirupathi, **Senbagavalli M**, T Poornachandar

Abstract

The present invention presents an artificial intelligence and machine learning–based predictive system for early identification, classification, and growth forecasting of cancer cells utilizing biomedical imaging. Through image preprocessing techniques that eliminate noise, adjust contrast, and show tiny cell features, the invention improves medical pictures obtained from MRI, CT, PET,
ultrasound, X-ray, and histopathology scanners. While a classification module using convolutional neural networks establishes whether the tumor is benign or malignant and defines its cancer subtype, a deep learning-based segmentation engine separates the suspicious tumor zone from the surrounding tissues. Along with diagnosis, the invention incorporates a predictive forecasting module that estimates future tumor behavior, such as changes in size, shape, and metastatic potential, by analyzing historical and current medical scans. The technology delivers a comprehensive digital report with segmented tumor pictures, classification results, and graphical prediction charts. The innovation gives healthcare facilities remote diagnostic access by supporting cloud computing, telemedicine, and hospital information systems. The suggested invention minimizes human error, speeds up diagnostics, and facilitates early clinical decision-making for efficient cancer treatment planning by fusing automated detection, accurate classification, and predictive tumor growth modeling.

Application No **202541127469**

Title of the invention **WEAR-RESISTANT CO-CR-W-FE3AL-TA BASED HIGH-ENTROPY ALLOY COATING FOR HIGH-SPEED STEEL CUTTING TOOLS**

Dr. C. Venkatesh
Professor
Mechanical Engineering
Alliance School of Applied Engineering

Name of Inventor: **Dr. C. Venkatesh**, and Dr. A. Saravankumar

Abstract

A high-entropy alloy coating for HSS turning inserts comprising Co (48 wt%), Cr (29 wt%), W (13 wt%), Fe_3Al (5 wt%), and Ta (5 wt%) deposited through laser cladding technology. The process employs continuous-wave fiber laser at 1.2 kW power, 7 mm/s scanning speed, 3 mm spot size, 10 g/min powder feed rate, and 10 L/min argon shielding gas with 35-45% track overlap achieving 1 mm uniform coating thickness. Arc-melted HEA powder undergoes rapid solidification at cooling rates of 10^3-10^5 K/s, forming fine dendritic microstructures consisting of FCC Co-Cr solid-solution matrices reinforced with W/Ta-rich carbides and Fe-Al intermetallic phases. The coating exhibits exceptional hardness, superior wear resistance, thermal stability up to 1200°C, and oxidation protection, enabling high-speed and dry machining operations with extended tool life across automotive, and precision manufacturing applications.

Application No **202541127647**

Title of the invention **SUBSTITUTED OXADIAZOLE-THIADIAZOLE HYBRIDS FOR TREATMENT OF BREAST AND COLORECTAL CANCERS**

Dr. Chandni Pathak
Assistant Professor
Chemistry
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Name of Inventor: Ramesh Pala, and **Dr. Chandni Pathak**

Abstract

This invention relates to novel 1,2,4-oxadiazole bearing 1,3,4-thiadiazole derivatives (6a-6l) comprising a 1,3,4-thiadiazole ring connected via methylenethio linker (SCH_2) to a 1,2,4-oxadiazole ring with urea functionality and various substituted phenyl groups. The compounds are synthesized through catalyst-free multi-step methodology involving thiadiazole-thiol preparation, urea precursor formation, oxadiazole scaffold synthesis, and final coupling reaction with yields of 69-94%. The derivatives exhibit exceptional anticancer activity with IC_{50} values of 3.85-10.90 µg/mL against breast cancer cells (MDA-MB-231, MCF-7) and 5.01-18.92 µg/mL against colon cancer cells (HCT116, Caco-2), comparable to or surpassing doxorubicin. Compound 6g demonstrates optimal binding energy (-7.79 kcal/mol) with breast cancer proteins. The compounds display favorable drug-like properties including Lipinski compliance, good intestinal absorption, minimal toxicity, and bioavailability scores of 0.55, suitable for pharmaceutical compositions treating breast and colon cancer.

Application No **202541127978**

Title of the invention **METHOD FOR CONTINUOUS MONITORING OF PARKINSONS SYMPTOMS USING INTEGRATED WEARABLE SENSOR AND CLOUD ANALYTICS**

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Name of Inventor: D M Surya, **Dr. Neelapala Anilkumar**, Vishakha Roy, Rashi G Suvarna, Vinay H and Harshith S

Abstract

A method for continuous monitoring of Parkinson's symptoms comprising: providing a wearable device integrating EMG sensor (500 µV-2 mV), GSR sensor (1-10 µS), IMU sensor, temperature sensor, and pulse sensor connected to ESP32-WROOM-32 microcontroller; continuously acquiring sensor data at optimized sampling rates (1 kHz EMG, 200 Hz IMU, 100 Hz GSR) through specific GPIO pin assignments; conditioning EMG signals using instrumentation amplifier (1000× gain), high-pass filter (10 Hz), and low-pass filter (500 Hz); processing data in real-time by executing detection algorithms identifying muscle rigidity (0.5 mV resting EMG), Parkinsonian tremor (4-6 Hz via FFT analysis), autonomic dysfunction, and gait abnormalities; wirelessly transmitting processed data via WiFi to cloud platforms (ThingSpeak/ Firebase/MongoDB); applying cloud analytics for pattern recognition and predictive insights; generating alerts when abnormalities detected; visualizing real-time/historical data through dashboard displays; and enabling healthcare providers to adjust treatment plans based on continuous monitoring, facilitating personalized intervention.

Application No **202541132734**

Title of the invention **NATURAL BIOFIBER REINFORCED COMPOSITE PROSTHETIC SOCKET FOR TRANSTIBIAL AMPUTEES**

Dr. Indran Suyambulingam
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Mechanical Engineering
Alliance School of Applied Engineering

Name of Inventor: **Dr. S. Indran**

Abstract

A method for manufacturing natural biofiber-reinforced composite prosthetic socket for transtibial amputees comprises extracting flax fibers through microbial retting, subjecting fibers to 5 vol.% NaOH alkali mercerisation treatment for 2-6 hours to remove hemicellulose, lignin, and waxy contaminants, washing, neutralizing, and drying to moisture content below 10 wt.%. Composite fabrication employs Plaster of Paris mould-based lay-up utilizing four layers of 180 GSM flax woven fabric in bidirectional orientations with 120 GSM cotton stockinet outer layer, impregnated with epoxy resin LY556 and hardener HY951 in 10:1 ratio maintaining 40 wt.% fiber and 60 wt.% epoxy system. Room temperature atmospheric pressure curing for 24 hours eliminates autoclave requirements. The socket achieves 4-8 mm wall thickness with increased thickness in high-stress regions and demonstrates validated compliance through ISO 10328 structural protocols including 3 million cycle fatigue testing, providing environmentally sustainable, cost-effective prosthetic solution for clinical deployment.

Application No **202541133111**

Title of the invention

COGNITIVE ASSESSMENT AND EARLY DIAGNOSIS SYSTEM FOR ALZHEIMER'S DISEASE AND DEMENTIA USING MULTIMODAL ARTIFICIAL INTELLIGENCE

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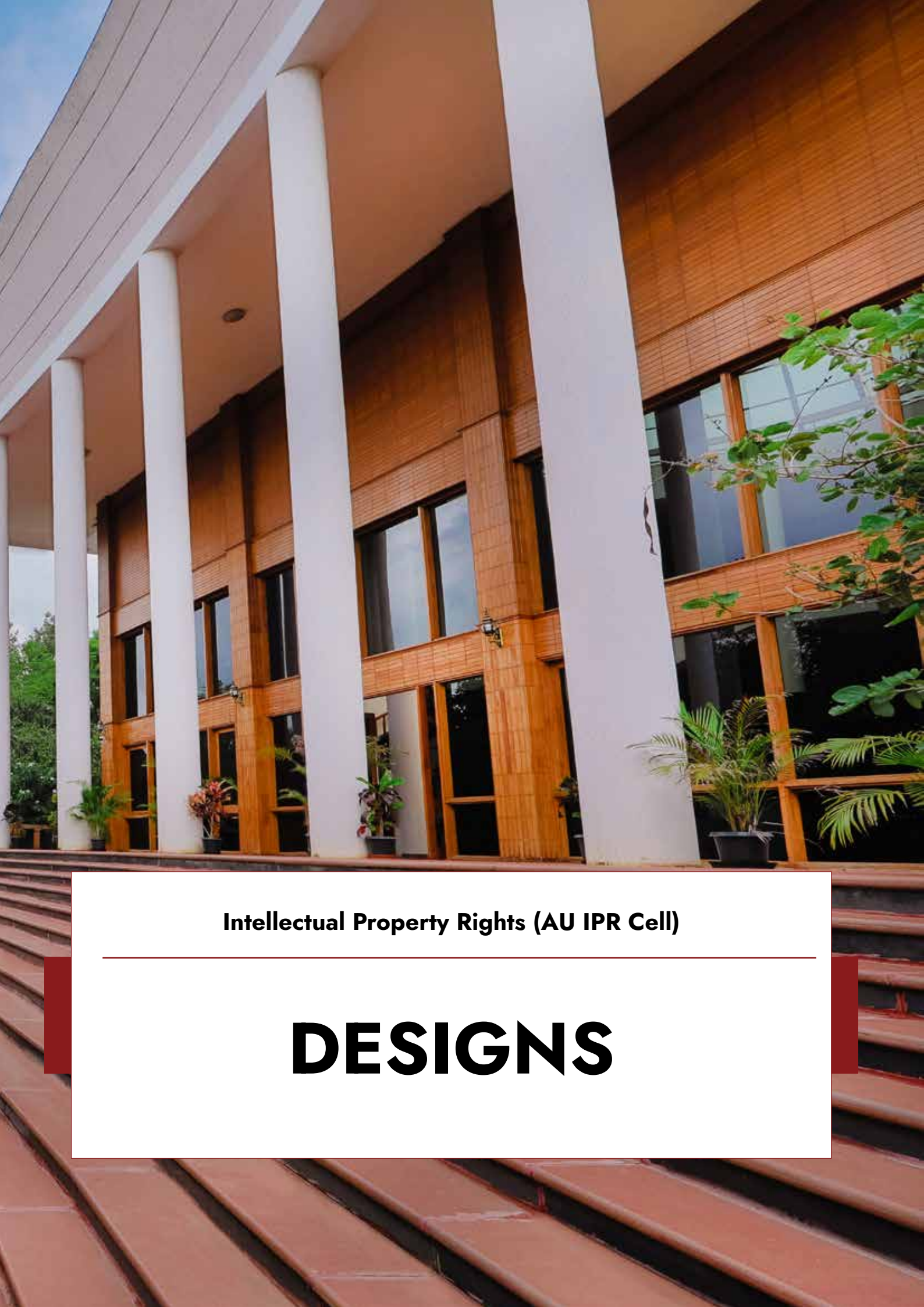
Name of Inventor

Dr. Tosendra Dwivedi, Manjari Shree, Ms .Sandhya Dixit, Ms .Sharmili Chatterjee, Ms Deeksha K Murthy, **Dr. Devanjan Khuntia**, Nivedita M Banoshi

Abstract

The Present invention relates to a comprehensive cognitive assessment and early diagnosis system for Alzheimer's disease and dementia utilizing multimodal artificial intelligence technology is disclosed. The system integrates multiple data streams including neuropsychological test results, speech pattern analysis, eye-tracking movements, facial expression recognition, and lifestyle behavioral data through advanced machine learning algorithms. Deep neural networks process these diverse inputs to identify subtle cognitive decline indicators before clinical symptoms manifest. The system employs explainable AI frameworks to provide transparent diagnostic reasoning while maintaining high accuracy rates exceeding conventional assessment methods. Real-time monitoring capabilities enable continuous tracking of cognitive health trajectories and treatment response evaluation. The platform offers personalized risk stratification, early intervention recommendations, and longitudinal cognitive performance tracking. Cloud-based architecture ensures scalability and accessibility across healthcare settings while maintaining strict data privacy protocols.





Intellectual Property Rights (AU IPR Cell)

DESIGNS

Design No: **470568-001**

Title of the Design:

COGNITIVE AND LEARNING EDUCATION DEVICE

Name of Applicant:

Dr. Swetha N, Dr. Aparna R Hawaldar, Dr. Rasna Sehrawat, and Dr. Jamakhandi Hayavadana

Dr. Swetha N
Associate Professor
General Management
Alliance Ascent College

Description

The Cognitive and Learning Education Device features a compact, tablet-like structure designed for interactive digital learning and cognitive engagement. The design incorporates a large central display interface, an integrated camera module for visual communication or monitoring, dual audio output zones, and a stylus docking section enabling writing and drawing activities. The device is engineered to support educational interaction, multimedia-based instruction, and secure user accessibility through intuitive control elements. Its ergonomic and portable configuration enhances usability, durability, and learner comfort, making it suitable for technology-assisted education and skill development environments.



Design No: **473467-001**

Title of the Design:

AI BASED DEVICE FOR DETECTION OF CARDIAC DISEASES

Name of Applicant:

Dr Senbagavalli M, Dr Saswati Debnath, Dr Ramalakshmi K, Prof. Radha R, Dr Virendra Kumar Shrivastava, Dr Shekhar R, Dr K Sasi Kala Rani, and Dr Gnanaprakasam Thangavel

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Dr. Gnanaprakasam Thangavel
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Description

AI Based Device for Detection of Cardiac Diseases features a compact, console-style diagnostic unit designed for intelligent cardiovascular monitoring and analysis. The design incorporates an integrated display interface, multiple control buttons, and sensor connectivity ports linked to external electrode pads for physiological signal acquisition. The system is engineered to capture, process, and interpret cardiac parameters using AI-assisted algorithms for early detection and assessment of potential heart conditions. Its structured and ergonomic configuration supports clinical usability, accurate data handling, and efficient patient monitoring within technology-enabled healthcare environments.



Design No: **475727-001**

Title of the Design:

IOT-ENABLED LIVESTOCK TRACKER TAG

Name of Applicant:

Dr. Rajasekar Rangasamy, Dr. Balaji Venkatesan, **Dr. J. Lenin, Dr. A. Ezil Sam Leni, and Dr. R.C. Karpagalakshmi**

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Dr.R.C.Karpagalakshmi
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Alliance School of Advanced Computing

Description

IoT-Enabled Livestock Tracker Tag features a compact, wearable electronic tag designed for real-time animal monitoring and tracking. The design incorporates a central indicator/display area, wireless connectivity modules, and visual status indicators for operational feedback. The system is engineered to enable location tracking, identification, and data transmission through integrated IoT communication technologies. Its lightweight, durable, and ergonomic configuration supports secure attachment, long-term field operation, and efficient livestock management within smart farming and precision agriculture environments.



Design No: **475904-001**

Title of the Design:

WIRELESS FIELD MONITORING STATION

Name of Applicant:

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Description

Wireless Field Monitoring Station features a portable, handheld monitoring unit designed for on-site environmental and operational data assessment. The design incorporates an integrated display interface, functional control buttons, visual status indicators, and a solar panel module for auxiliary power support. The system is engineered to enable wireless data acquisition, processing, and transmission across field-based applications. Its ergonomic, durable, and self-sustaining configuration supports mobility, reliable outdoor operation, and efficient monitoring within remote sensing, agricultural, and industrial field environments.



Design No: **474568-001**

Title of the Design:

IOT ENABLED REMOTE STRUCTURAL HEALTH MONITORING DEVICE

Name of Applicant:

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Description

IoT Enabled Remote Structural Health Monitoring Device features a compact, console-style monitoring unit designed for continuous assessment of structural integrity. The design incorporates a large display interface, dual antenna modules for wireless communication, and an integrated control panel for operational interaction. The system is engineered to acquire, process, and transmit structural performance data through IoT-enabled connectivity for remote diagnostics and condition monitoring. Its robust and ergonomic configuration supports reliable deployment, real-time analysis, and efficient monitoring across civil, mechanical, and infrastructure health management applications.





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