



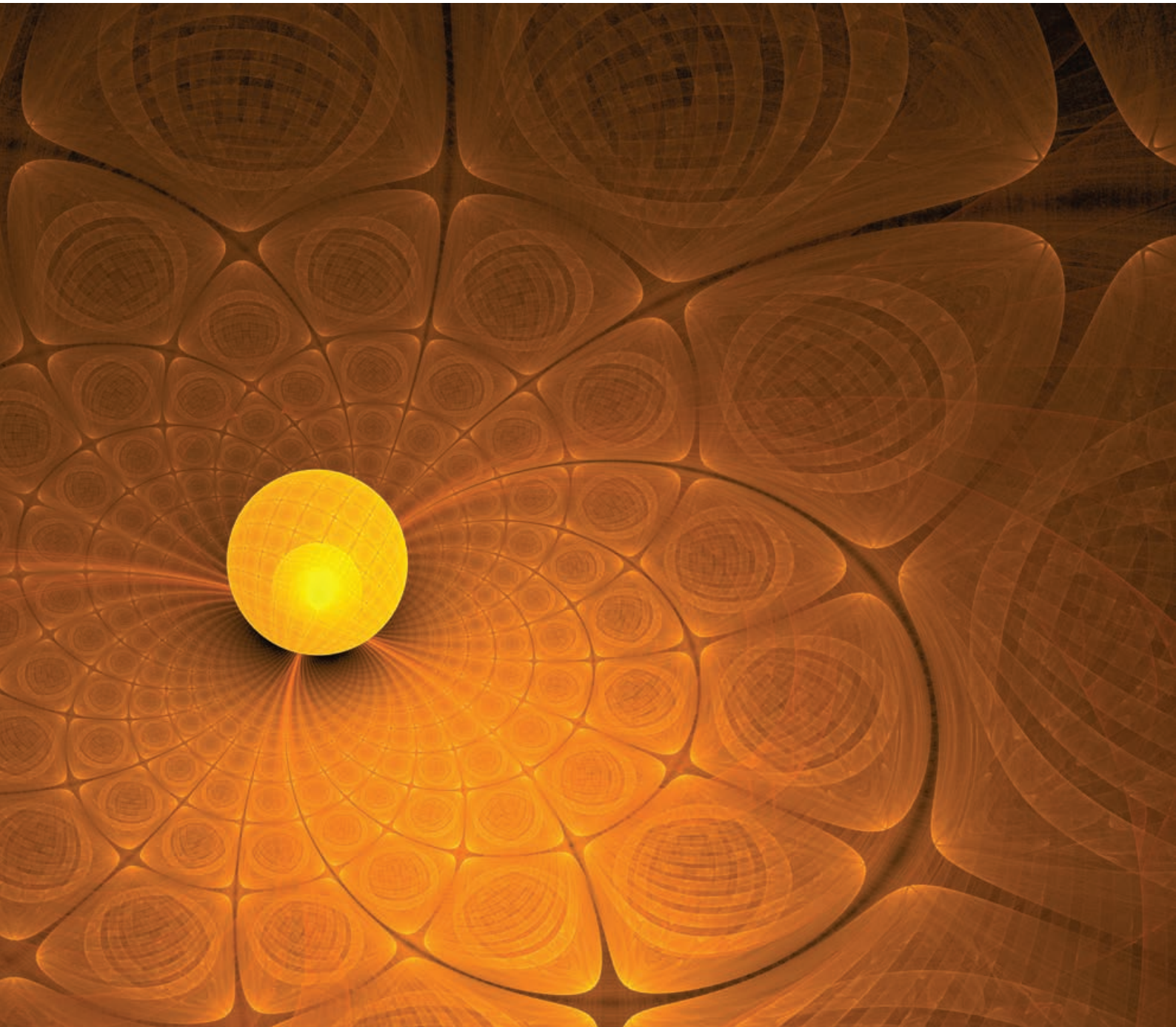
ALLIANCE
UNIVERSITY
CENTRE for RESEARCH



APRIL 2025

Volume 4

ALLIANCE RESEARCH CHRONICLES





ALLIANCE RESEARCH CHRONICLES

APRIL 2025

Volume 4

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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

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.

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.

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 Centre 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

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.

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.

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

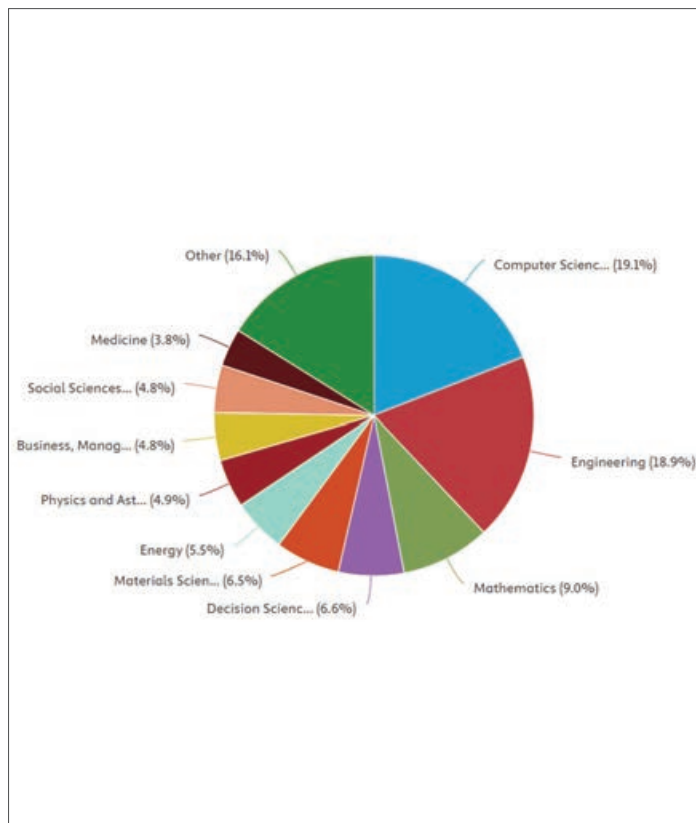
- Support the Ph.D. Admission process and facilitate the Ph.D. Program across all academic units of Alliance University.
- Providing resources and support for faculty, students, and visiting/full-time scholars engaged in research activities.
- Contributing to the advancement of knowledge through publications, 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.



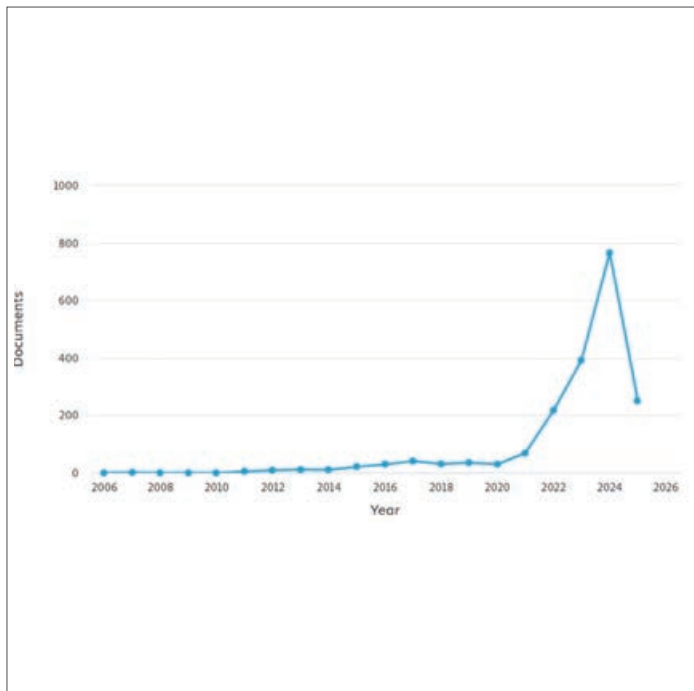


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|---------------------------|-----------------------|
| 1,924 Documents | 661 Authors |
|---------------------------|-----------------------|

Documents by Subject Area



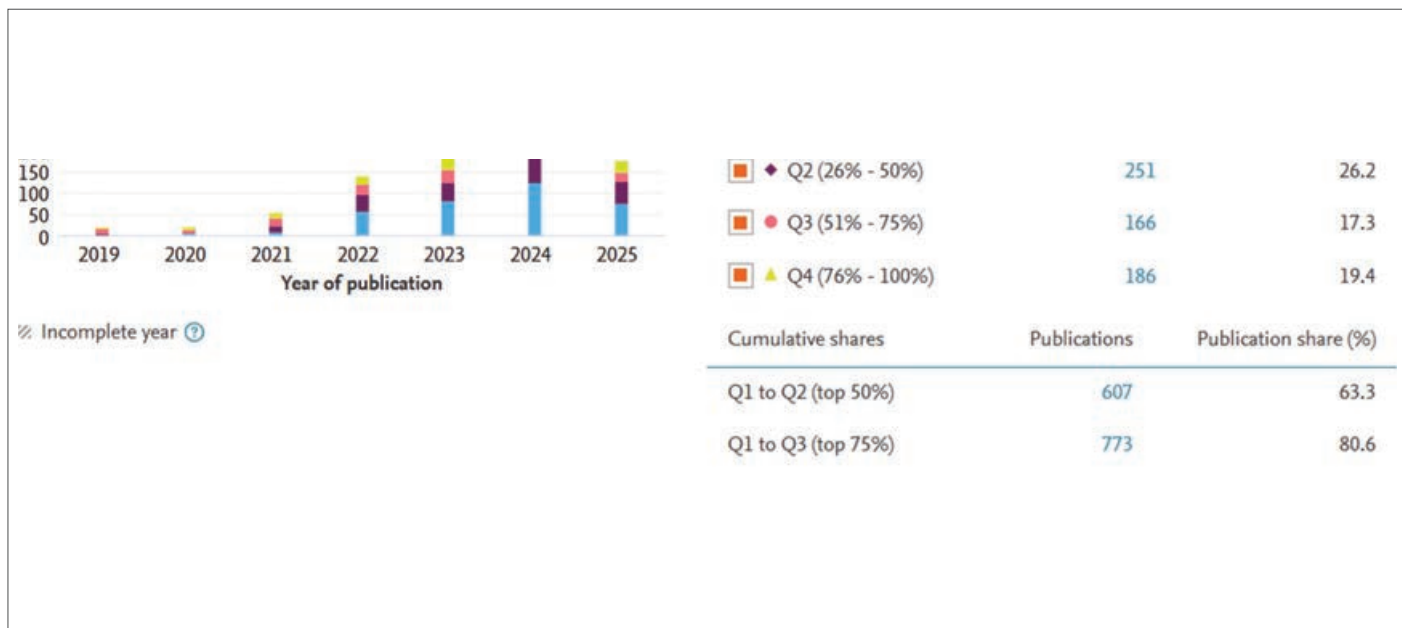
Documents by Year



Summary

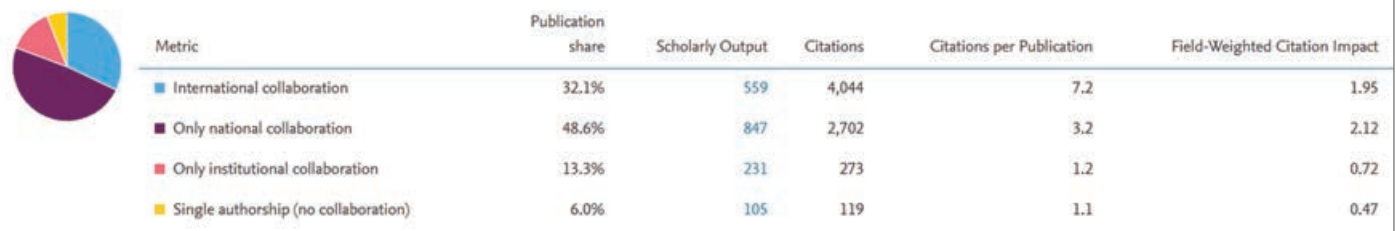
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|------------------|------------|----------------|---------------------------|--------------------------------|-----------|
| 1742 | 761 | 7138 | 4.1 | 1.78 | 19 |
| Scholarly Output | Authors | Citation Count | Citations per Publication | Field-Weighted Citation Impact | h-5 index |
| 18.5% | | | | | |
| All Open Access | | | | | |

Publication by Journal Quartile

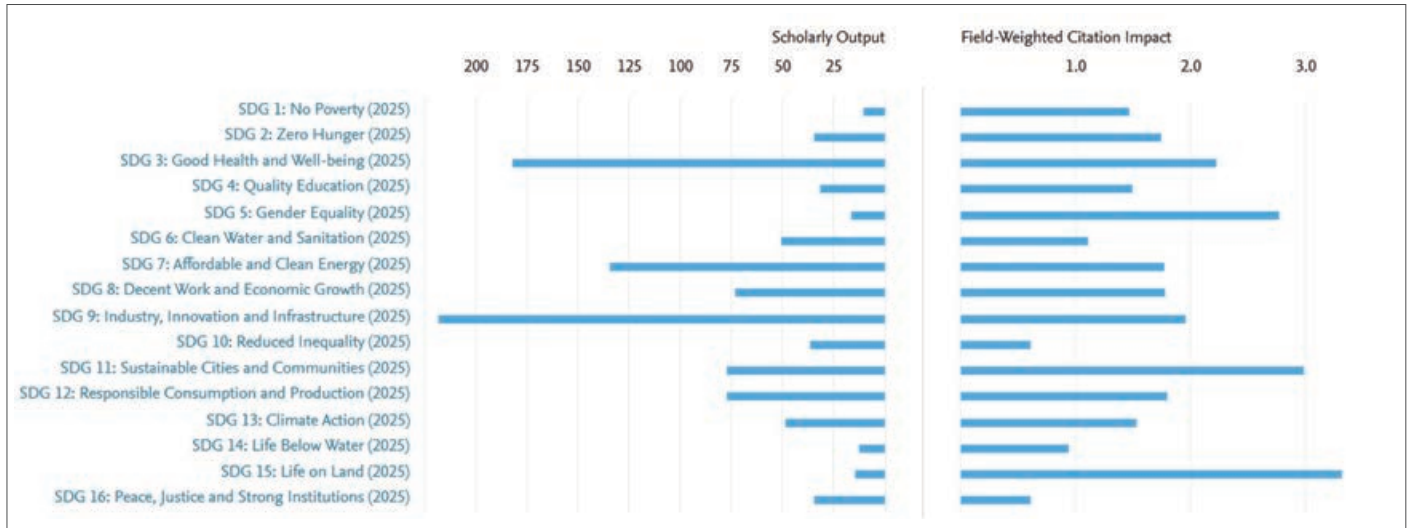


Geographical Collaboration Overall

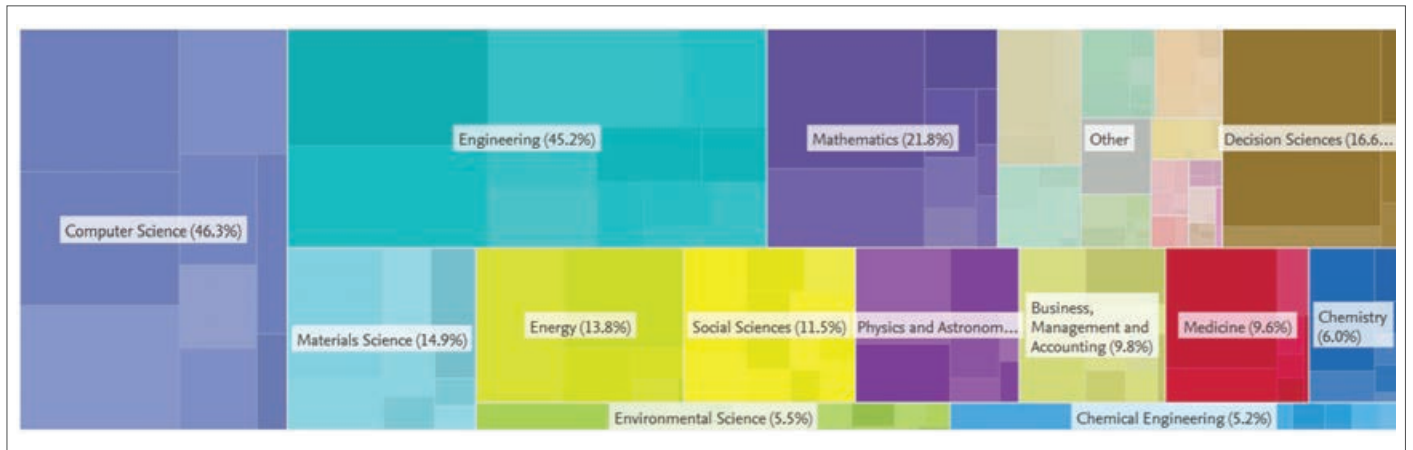
International, national and institutional collaboration by Alliance University in the selected year range.



Publication by SDG



Subject Areas





Scopus
JOURNALS



ClarivateTM
Web of Science

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q2 | 52nd | 1.62 |  07 AFFORDABLE AND CLEAN ENERGY |

TENSILE, FLEXURAL, AND FATIGUE RESPONSES OF LIGHTWEIGHT PUMICE-REINFORCED MAGNESIUM COMPOSITE: EXPERIMENTATION FOLLOWED BY AN ANALYTICAL MODELING

Nagarajan B.; Govindasamy K.; **Chenrayan V.**; Shahapurkar K.

Journal of Engineering Materials and Technology Volume 147, Issue 31 July 2025 Article number 031001



Dr. C Venkatesh

Professor
Alliance School of Applied Engineering

| | |
|--|---|
|  | <p>CURRENT ISSUE</p> <p>July 2025, Volume 147, Issue 3</p> <p>View This Issue</p> <hr/> <p>ISSUES IN PROGRESS</p> <p>Volume 147, Issue 4, October 2025</p> |
|--|---|

Abstract

Featherweight material to sustain mountainous loads is an extreme contrast. Still, in reality, the automobile and aerospace industries seek very light materials with high specific strength to survive in global competition. This study offers a timely answer to the problems faced by those sectors. Through the use of a stir-assisted squeeze casting method, the current investigation aims to generate a lightweight magnesium composite that is reinforced with porous low-density pumice particles at weight percentages of 5%, 10%, and 15%. An examination of the density indicates that there is a downward tendency in conjunction with the growing reinforcement. In comparison to the magnesium alloy in its natural state, the Pumice 15 coupon

achieves a tensile strength increment of 47%, flexural strength increment of 35%, and a 10-time increment in service cycle at fatigue increase. The micromechanics model is implemented to justify the strengthening process in terms of the adhesion between the filler matrix and the interface shear strength. The property plots that were drafted provide evidence that the suggested material is lightweight while exhibiting a significant amount of strength in tensile, flexural, and fatigue. Post-fracture surface morphology analysis exhibits distinct tensile, flexural, and fatigue patterns.

10.1115/1.4067134 Copyright © 2024 by ASME.

Author keywords- fatigue strength; flexural strength; interface shear strength; magnesium; porous rock; tensile strength

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|-----|
| SCOPUS/WOS/Q2 | 69th | 3.5 | |



CHARACTERIZATION OF NOVEL CELLULOSIC FIBER EXTRACTED FROM AGRO-WASTE OF RICINUS COMMUNIS PLANT FOR SUSTAINABLE GREEN COMPOSITE MATERIALS

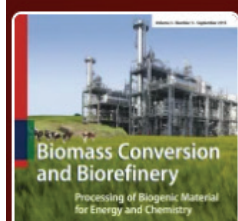
Senthil Kumar P.; Sathishkumar T.P.; **Rajeshkumar L.**

Biomass Conversion and Biorefinery Volume 15, Issue 7, Pages 11199 – 11215 April 2025



Dr. Rajeshkumar Lakshminarasimhan

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Biomass Conversion and Biorefinery

Processing of Biogenic Material for Energy and Chemistry

Publishing model

Hybrid

Abstract

Biowastes from agricultural and other industrial plants have been identified as potential fibers for the development of biocomposite materials for various industrial products. This study focuses on a novel cellulosic fiber extracted from the agro-wastes of *Ricinus communis* (RC) plant stem. The raw RC fibers extracted from the stems were separated by the manual retting process, dried, shortened, and alkali-treated with NaOH solution at varying percentages. Results portrayed that 4% treated fiber showed better characterization results. The physical characterization includes the density and the diameter of the RC fibers which are found to be in the range of 1.24 g/cc and 235 μm respectively. Chemical characterization studies represent the changes in the composition of cellulose, wax, lignin, pectin, and hemicellulose from raw and chemically treated RC fibers due to alkaline treatment for surface modification in the future development of biocomposite materials. Thermal analysis data showed that the biofibers were thermally stable in the range of

300 to 350 $^{\circ}\text{C}$. The X-ray diffraction spectrum analysis showed almost the same crystallinity index for both raw and treated fibers in the range of 40%. The physical structure of raw and alkali-treated fibers was examined by scanning electron microscopy (SEM), also the elements of carbon, hydrogen, hydroxyl, and other chemical bonds were identified using FTIR spectroscopy, exhibiting the presence of required bio-composition. The tensile properties of the fibers were found to have a tensile strength of 428 MPa and Young's modulus of 9.89 GPa. The surface texture of the treated fiber had a higher roughness, which would result in higher reinforcement in polymer-based biocomposites. In addition, RC fibers are abundant and can be potential, biodegradable, economical, and productive biofiber for developing sustainable green composite materials.

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Author keywords- FTIR spectroscopy; *Ricinus communis* fiber; Characterization; Cellulosic; SEM; TGA; XRD analysis

ENHANCEMENT OF THERMAL CONDUCTIVITY IN SILICONE RUBBER NANOCOMPOSITES VIA LOW LOADING OF POLYDOPAMINE-COATED COPPER NANOWIRES

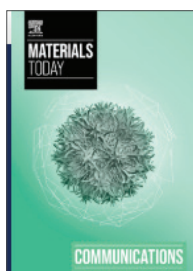
Hegde M.; Chandrashekar A.; Reddy B K.; **Gopi J.A.**; Ajeya K.P.; Prabhu T.N.

Materials Today Communications Volume 4 5 April 2025 Article number 112353



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materialstoday
COMMUNICATIONS

Abstract

In recent years, thermally conductive polymer nanocomposites have garnered significant interest due to their wide application in the electronic industry. In the present work, we report thermally conductive silicone rubber-based nanocomposites at lower filler loading of polydopamine-coated copper nanowires (PDA@CuNW). First, copper nanowires (CuNW) are synthesized by the liquid phase reduction method and modified with polydopamine (PDA) by in-situ polymerization. The synthesized CuNW and PDA@CuNW are incorporated into Silicone rubber (SR) varying from 1 to 5 wt% via solution casting. The incorporation of 5 wt% PDA@CuNW resulted in a 62 % improvement in the thermal conductivity of SR. In addition, the nanocomposite showed the highest thermal effusivity of $735 \text{ Ws}^{1/2}\text{m}^{-2} \text{K}^{-1}$ even at 5 wt% loading. These results can be attributed to the better adhesion of PDA to

the SR matrix confirmed by Field Emission-Scanning Electron Microscopy (FE-SEM). Thermogravimetric analysis showed that the modification of copper nanowires improved the thermal stability of SR. The electrical resistivity of SR increased with the addition of PDA@CuNW. The tensile stress-strain studies reveal that the strength of the SR/PDA@CuNW was improved compared to neat SR and SR/CuNW composites. Moreover, the elongation at break reached up to 972 % which is a 395 % improvement with respect to plain SR. In this work, simultaneous improvement in thermal conductivity and electrical resistivity is achieved while preserving the mechanical properties of the SR nanocomposites. Flexible nanocomposites with improved thermal and electrical properties and minimal filler loading have great significance in high-performance thermal management materials. © 2025 Elsevier Ltd

Author keywords- Copper nanowire; Polydopamine coating; Silicone rubber; Thermal conductivity

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q2 | 65th | 3.5 |  |

ENHANCING HEALTHCARE DATA SECURITY USING RFE AND CRHSM FOR BIG DATA

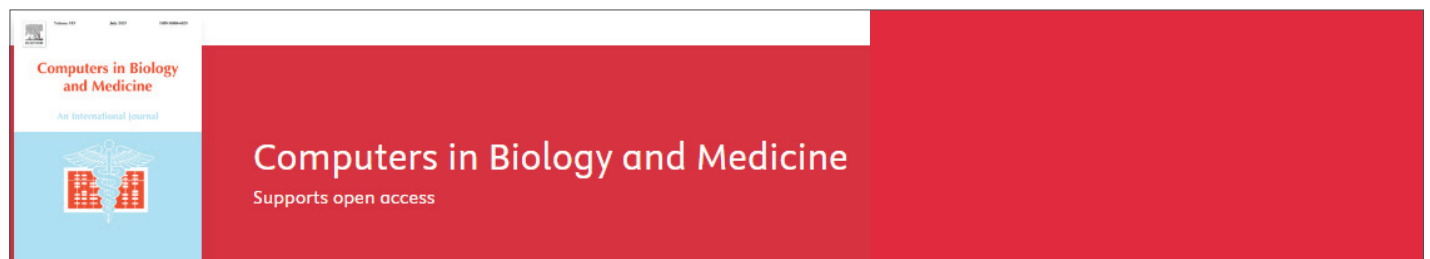
Sreedhar C.; Mahesh babu K.; Kallam S.; **Ghantasala G.S.P.**; Anthoniraj S.; Kumarganesh S.; Martin Sagayam K.; Pandey B.K.; Pandey D.

Computers in Biology and Medicine Volume 190 May 2025 Article number 110063



Dr. GGS Pradeep

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Computing



Abstract

Providing security to the medical big data stored in healthcare cloud systems is the most exciting and demanding task in the present day. Many researchers use cryptographic techniques to protect big data against malicious users/attacks in cloud environments. Still, they face the problems of high complexity in operations, increased time consumption, storage overhead, and lack of efficiency. Hence, this paper aims to develop a new extensive data security framework for improving the reliability of healthcare systems. The main contribution of this work is to introduce a novel Cohesive Random-Hash based Security Model (CRHSM) for securing both user authentication and medical records. Here, the hospital environment is considered with the entities of patients, healthcare professionals, and hospital servers. In this environment, the registered entities can only participate in communication, including system

initialization, registration, login, authentication, encryption, and decryption modules. First, the entities must register with the hospital server to obtain the smart card for further communications. Here, the Squirrel Search Optimization (SSO) technique generates the random number used for the registration phase. During the login and authentication module, the legitimacy of patients and healthcare professionals is validated based on the authentication parameters. Moreover, the medical records are encrypted before storing them in the cloud systems using an efficient Reformist Feistel Encryption (RFE) mechanism. Moreover, various evaluation parameters are considered for assessing the performance of the proposed model, and the evaluated values are compared with security approaches to validate the effectiveness of the proposed scheme. © 2025 Elsevier Ltd

Author keywords- And data encryption; Big data security; Cloud; Cohesive random-hash based security model (CRHSM); Healthcare data storage; Reformist feistel encryption (RFE); Squirrel search optimization (SSO)

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------------------|---------------|-----|
| SCOPUS/Q1 | 80th | 4.3 | |



ENHANCED LAYER EXTRACTION FOR EFFICIENT PLANT DISEASE CLASSIFICATION USING EFFICIENTNET B1

Thakur A.; Thakur A.; **Vivek V.**; Mahesh T.R.; Krishna K.M.

SN Computer Science Volume 6, Issue 4 April 2025 Article number 379



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Enhanced Layer Extraction for Efficient Plant Disease Classification using Efficientnet B1

Original Research | Published: 11 April 2025

Abstract

Agriculture is crucial for the global economy, providing sustenance and resources for various industries. However, plant diseases threaten crop quality and yield, risking severe economic impacts. Traditional plant disease diagnosis methods, like manual inspection or basic machine learning, are slow, require expertise, and struggle with scalability and adapting to new diseases. This study introduces a deep learning model using convolutional neural networks (cnns) to autonomously detect and classify plant diseases from images, enhancing speed, scalability, and accuracy. We utilize the efficientnetb1

architecture, pretrained on imagenet and fine-tuned on a dataset of bell pepper, potato, and tomato diseases, recognizing 14 diseases plus healthy plants. The model achieves 98.80% accuracy on the test dataset, with high precision, recall, and F1-scores, demonstrating its effectiveness in plant disease diagnosis. This advancement marks a significant step in automating plant disease diagnosis, offering a robust tool for effective disease management in agriculture.

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Author keywords- Agriculture; Automated diagnosis; Deep learning; Disease management; Efficientnetb1; Image classification; Plant disease detection; Transfer learning

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------------------|---------------|-----|
| SCOPUS/Q1 | 97th | 6.4 | |



ALGORITHMIC PROFILING AND FACIAL RECOGNITION IN EU BORDER CONTROL: EXAMINING ETIAS DECISION-MAKING, PRIVACY AND LAW

Thommandru A.; Mone V.; Shokhijakhon F.; Mirzayev G.

Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery Volume 15, Issue 2 June 2025 Article number e70013



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WIREs Data Mining and Knowledge Discovery: Volume 15, Issue 2

June 2025

Abstract

The growing use of algorithmic and biometric technologies in border control is part of a larger trend in global security governance that has significant legal and ethical implications for their effect on individual rights and procedural justice. As central features in the EU's shifting security regime, ETIAS and facial recognition technologies deploy algorithmic profiling and biometric risk assessment to screen visa-exempt third-country nationals. The research systematically examines the decision-making processes of ETIAS and the overall facial recognition system, demonstrating the interplay between algorithmic risk assessments and discretionary human discretion by national authorities. It contends that the algorithmic profiling lack of transparency, combined with sweeping national security exceptions, produces a procedural void, in which the right to reasoned decisions and effective remedies is compromised. Second, the use of interoperable databases and risk indicators

puts core data protection principles into jeopardy, notably purpose limitation and the right to be forgotten. This paper also argues that ETIAS and the application of facial recognition technologies represent a larger trend toward "techno-regulatory assemblages" in EU governance, where technological infrastructures increasingly influence legal and administrative decisions. It critically assesses whether the human oversight mechanisms incorporated within ETIAS National Units are adequate to prevent the risks involved in automated decision-making, especially in the face of strict time pressures and security requirements. The study detects a latent paradox: though these systems aim to strengthen a "Security Union," they might inadvertently lead to an "Insecurity Union" by undermining transparency, procedural protections, and citizen rights.

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Author keywords- administrative justice; algorithmic profiling; ETIAS; EU governance; facial recognition; national security; procedural rights

FAILURE PREDICTION OF GEARED MECHANISM AT MULTIPLE GEARSHIFT CONFIGURATION BY UTILIZING THE EXPERIMENTAL DESIGN AND INTEGER PROGRAMMING METHOD

Mandol S.; Bhattacharjee D.; **Kumar M.H.**; Govindan R.; Kaur G.; Jain N.; Verma A.

International Journal on Interactive Design and Manufacturing Volume 19, Issue 3, Pages 2113 – 2127 March 2025 Article number 041701



Dr. Mohit Hemanth Kumar

Assistant Professor & Associate Director
- Centre of Excellence (IPR Cell)
Alliance School of Applied Engineering



International Journal on Interactive Design and Manufacturing (IJIDeM)

Publishing model
Hybrid

Abstract

This research paper aims to model the failure pattern based on safety factor data at different gear shift configurations for a compound planetary gear assembly. An optimization approach is expounded in this work, which aims to reduce the developed stresses within the gearbox assembly while considering all the gear-shift configurations. Computer-aided engineering software, in conjunction with the Design of Experiments technique, is employed to analyze the computer-aided design model of the gear assembly with gear shift configurations of gear members. The method of integer programming provides an optimal solution by deducing a safety factor value, indicating the system's capacity to withstand the specified loading condition.

Here in the proposed safety factor model emphasizes on the failure analysis for a Ravigneaux gearbox, based on the material failure theory, to enhance the load-bearing capacity for all shift configurations of the compound epicyclic gear assembly. The regression models for three safety factor values based on maximum equivalent stress, maximum shear stress, and fatigue exhibit a p-value close to zero. High significance has been observed with the thermal condition, suggesting that good lubrication is required to maintain the gearbox at an optimal temperature.

© The Author(s), under exclusive licence to Springer-Verlag France SAS, part of Springer Nature 2024.

Author keywords- Design of experiments; Failure modeling; Ravigneaux gearbox; Statistical estimation; Vehicle transmission

Indexing/Quartile

Percentile

Impact Factor

SDG

SCOPUS/WOS/Q2

69th

3.5



GREEN ENGINEERING OF CELLULOSE NANOFIBERS AND NANOPAPERS FROM WODYETIA BIFURCATA FRUITS: A SUSTAINABLE APPROACH WITH EMPHASIS ON PROCESS OPTIMIZATION AND TENSILE PROPERTY ASSESSMENT

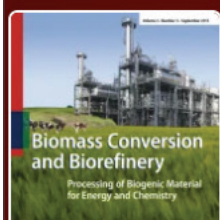
Parameswaranpillai J.; Sankar S.; K. V N.; Ajithkumar T.G.; Shelke A.; Begum P.M.S.; Kanoth B.P.; George T.S.; Badawi M.; C. D M.D.

Biomass Conversion and Biorefinery Volume 15, Issue 6, Pages 9321 – 9335 March 2025



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Biomass Conversion and Biorefinery

Processing of Biogenic Material for Energy and Chemistry

Publishing model

Hybrid

Abstract

Nanocellulose emerges as a highly promising material with versatile applications, offering solutions to environmental and sustainability challenges. This study delves into the extraction of cellulose nanofibers (CNFs) from *Wodyetia bifurcata* fruit pulp through mild oxalic acid hydrolysis assisted by steam explosion. To ensure environmental compatibility, chlorine-free pre-treatments were applied to eliminate non-cellulosic components. Chemical composition analysis verified the effective removal of non-cellulosic elements, validated by Fourier transform infrared spectroscopy (FTIR). Solid-state ¹³C nuclear magnetic resonance (¹³C NMR) spectroscopy confirmed the presence of type I cellulose β -polymorph in the CNF, while a crystallinity index of 60% was determined by X-ray diffraction analysis (XRD). The transmission electron microscopy (TEM) images

revealed a fibrous morphology with a fiber diameter ranging from 9 to 36 nm. Dynamic light scattering (DLS) was employed to corroborate the observed fiber diameter. Mild acid hydrolysis elevated the maximum degradation temperature (T_{max}) of CNF to 39 °C compared to the pristine sample. Furthermore, this research explores the application of CNFs in nanopaper development using a casting method. The resulting nanopapers exhibited a tensile strength of ~ 17 MPa and a transmittance of 25%. These nanopapers present a viable pathway toward eco-friendly products in various industries, promising to revolutionize upcoming sustainable packaging technologies.

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Author keywords- Nanocellulose; Nanopapers; *Wodyetia bifurcata*

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------------------|---------------|-----|
| SCOPUS/Q2 | 66th | 4.32 | |



AN ENHANCEMENT OF OBJECT DETECTION USING YOLO V8 AND MOBILE NET IN CHALLENGING CONDITIONS

Pasupuleti S.; **Ramalakshmi K.**; Gunasekaran H.; Arokiaraj R.M.; **Debnath S.**; Jebaseeli T.J.

SN Computer Science Volume 6, Issue 4 April 2025 Article number 321



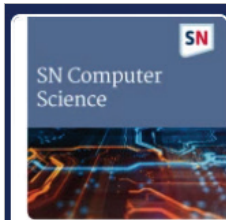
Dr. K. Ramalakshmi

Professor & HOD - Department of Computer Science and Engineering (All Specializations) & Director - Centre of Excellence (Computer Vision) Alliance School of Advanced Computing



Dr. Saswati Debnath

Assistant Professor
Alliance School of Advanced Computing



SN Computer Science

Publishing model
Hybrid

Abstract

Autonomous drones and deep learning neural networks are becoming popular tools to revolutionize aircraft operations by partially automating visual inspection processes in aircraft maintenance. The research aims to provide a trustworthy method for locating and classifying surface flaws on aircraft, such as dents, fractures, corrosion, and a few other anomalies. To assess the model performance with and without a lightweight network integration, the implementation merges YOLOv8 and Mobile Net architectures, using dropout regularization and data augmentation approaches. To guarantee the model's performance in low-light situations, the dataset has been carefully selected to contain images replicating such settings. Annotation, environment setup, model training, and online

dataset scraping are all covered by the thorough technique. A web-scraped dataset is used to train and validate two popular semantic segmentation algorithms, YOLOv8 and Mobile Net, which show enough performance for segmenting and grading aircraft surface problems in practical settings. The results show that precision and recall values are improved using a hybrid technique that ensembles trained Mobile Net and YOLOv8 models. Using COCO metrics, in the proposed approach an assessment of Ensemble WBF, Mobile Net-YOLO, and YOLOv8 outcomes on test and validation sets, guaranteed reliable object recognition and classification abilities.

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Author keywords- Aircraft; Classification; Mobile-Net; Object detection; Weighted Box Fusion; YOLOv8

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------------------|---------------|-----|
| SCOPUS/Q1 | 92nd | 4.7 | |



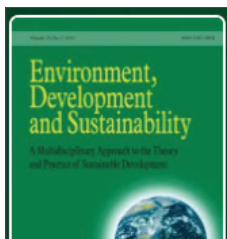
EXAMINING THE TOURISM-INDUCED ENVIRONMENTAL KUZNETS CURVE HYPOTHESIS FOR INDIA

Sharma M.; Mohapatra G.; Giri A.K.; Wijeweera A.; Wilson C. *International Journal of Biological Macromolecules* Volume 308 *Environment, Development and Sustainability* Volume 27, Issue 4, Pages 9107 – 9126 April 2025



Dr. Manu Sharma

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Environment, Development and Sustainability A Multidisciplinary Approach to the Theory and Practice of Sustainable Development

Publishing model
Hybrid

Abstract

This paper revisits the debate on the possible impact of tourism sector development on carbon emissions using annual time series data from 1980 to 2019. The present study is a pioneering attempt to estimate the threshold point for tourism-induced environmental Kuznets curve (EKC) for India. For this purpose, the autoregressive distributive lag model and block-exogeneity Granger non-causality test have been employed. The empirical results confirm a long-run cointegrating relationship between tourist sector development, real GDP per capita, energy consumption, urbanization and carbon dioxide (CO₂) emissions in India. The results also indicate a positive and significant association between the tourism sector, economic

growth, and carbon emissions in the long run and support the tourism-induced EKC hypothesis in India. Further, the study finds a long-run and short-run causal nexus between the variables. The findings also emphasize the need to rely less on the use of fossil fuels and instead transition to green energy production in the tourism industry. Given the size of the tourism industry in India, such practices would make a meaningful contribution to inclusive and sustainable development in the country.

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Author keywords- ARDL; CO₂ emissions; Environmental Kuznets curve; India; Tourism development

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q1 | 92nd | 3.8 |  |

ENHANCING DRILLING PERFORMANCE IN 3D PRINTED PLA IMPLANTS APPLICATION OF PIV AND ML MODELS

Shunmugesh K.; Ganesh M.; Bhavani R.; Khan M.A.; Saravana Kumar M.; **Rajeshkumar L.**; Mishra P.; Navasingh R.J.H.; J A.J.S.; Petru J.; Robert Č.

Scientific Reports Volume 15, Issue 1 December 2025 Article number 13314



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scientific reports


Abstract

Fused Deposition Modeling (FDM) is a common additive manufacturing technique known for its ability to quickly produce complex geometries and features according to customer requirements in a short timeframe. Parts produced by FDM technique with (Polylactic Acid) PLA can be used extensively as it is biocompatible in nature. The present investigation involves drilling the fabricated circular discs to assess the material removal rate (MRR) and hole profile. The inputs considered are spindle speed (SS), feed rate (fr), and drill diameter (dia), in relation to the output characteristics such as MRR, surface roughness (Ra and Rz), circularity, and cylindricity. This work employs the Proximity Indexed Value (PIV) tool to predict the

near-optimal value for improving hole quality and enhancing the drilling process. In addition, Artificial neural network (ANN), Support vector machine (SVM), and Random Forest (RF) models were employed to predict the optimized results by PIV method. The tests show that the RF model, which has a R^2 value of 99.16%, does a better job of describing the desired outcome than the ANN model (89.45%) and the SVM model (89.08%). This also proves that the machine learning (ML) models offer better prediction to the optimization of drilling parameters with reference to the quality of the workpiece machined.

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Author keywords- AM; ML; PIV; PLA; RF

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------------------|---------------|---|
| SCOPUS/Q1 | 90th | 0.36 |  |

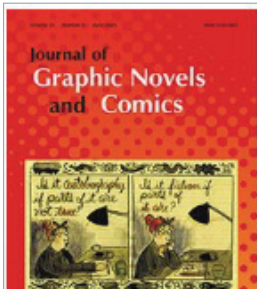
PLEASURE, 'EDUCATION', AND EROTISM: AN INTERSECTIONAL READING OF GENDER, SEX, AND SEXUALITY IN AGENTS OF ISHQ ZINES

Kuriakose L.J ; Bagchi S.S.;

Journal of Graphic Novels and Comics Volume 16, Issue 1-2, Pages 352 – 368 2025



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Journal of Graphic Novels and Comics

 Open Select: choose to publish open access

Publishes research on all aspects of the graphic novel, comic strip and and 21st centuries.

Abstract

Situated at the crossroads of scholarly inquiry in gender studies and counter-cultural studies, this paper analyses how the two zines by the multimodal platform Agents of Ishq viz. What is normal? AKA Heteronormativity Kya Hai? and The Political Power of Pleasure, 'perform' as a space for sexuality-studies sensitisation and create a platform for inclusive and intersectional sex education. The use of handmade illustrations, intermingled languages, 'cut-and-paste' collage style aesthetic, nonlinear narrative, and nonconformist content pose compelling questions related to erotic subcultures, cultural taboos,

heteronormativity, and discrimination. The analysis focuses on how the visual-verbal format of zines contribute to the need for narratives that focus on differences in experiences, instead of imposing single-axis ideas and representations, to explore how these texts represent the voices that lie at intersections by opposing homogenisation of identities and cultures. It highlights the need to acknowledge the intersectionality of sexual identities to practice a more inclusive and sensitised social activism.

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Author keywords- Gender; inclusivity in education; queer; sexuality; visual narratives; Zines

Indexing/Quartile

Percentile

Impact Factor

SDG

SCOPUS/WOS/Q2**69th****3.5**07
AFFORDABLE
AND CLEAN ENERGY

SUSTAINABLE CELLULOSE NANOFIBER EXTRACTION FROM BORASSUS FLABELLIFER: A COMPREHENSIVE STUDY AND ANALYTICAL INSIGHTS

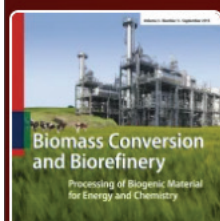
Surya S.; Soman A.; Krishnan A.; Suresh M.P.; Neenu K.V.; Ajithkumar T.G.; **Parameswaranpillai J.**; Sabura Begum P.M.; Midhun Dominic C.D.

Biomass Conversion and Biorefinery 2025



Dr. Jyotishkumar Parameswaranpillai

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Biomass Conversion and Biorefinery

Processing of Biogenic Material for Energy and Chemistry

Publishing model

Hybrid

Abstract

Cellulose, a biodegradable and renewable material, is versatile and transforms various fields. This work uses a chemo-mechanical method to discuss the extraction and analysis of palmyra (*Borassus flabellifer*) fruit derived cellulose nanofibers (PFCNF). The mild acid treatment, steam explosion, and homogenization could increase the physico-chemical properties of *Borassus flabellifer* fiber. The chemical composition and FTIR analysis confirmed the successful elimination of the hemicellulose, lignin, and other extractives in the palmyra fruit pulp. The solid-state ¹³C NMR proved the cellulose type I structure of the extracted PFCNF. The crystallinity index of PFCNF was found to be 57%. The yield of the cellulose was

calculated to be 44%. PFCNF exhibited fibrous morphology with a nanodimension of 10–80 nm, validated using scanning electron microscopy and transmission electron microscopy. With progressive treatments, the thermal stability was increased, and the T_{max} of PFCNF was 32 °C higher compared to the raw fibers. These superior properties further support their potential in eco-friendly packaging, advanced composites, biomedical materials, film production, electronics, coating materials, and paper production.

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Author keywords- Biomass; *Borassus flabellifer*; Cellulose nanofiber; Eco-friendly extraction; Sustainable materials; Waste valorization

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------------------|---------------|-----|
| SCOPUS/Q2 | 65th | 3.68 | |



FABRICATION OF POLYVINYLALCOHOL-ZINC OXIDE PAPER ASH COMPOSITE: A NOVEL, SUSTAINABLE AND ANTIMICROBIAL FOOD PACKAGING MATERIAL

Mukherjee A.; Malik R.; **Roy S.**; Kar P.; Bal T.; Dasgupta Ghosh B.

Journal of Vinyl and Additive Technology 2025



Dr. Sunanda Roy

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Alliance School of Applied Engineering



Abstract

This paper introduces an innovative strategy for preparing sustainable food packaging composite material comprising water-soluble PVA and varied content of antimicrobial ZnO paper ash (0, 1, 5, and 10) wt.%. Following the sustainable approach, the ZnO nanoparticles are synthesized using waste papers in a simple and efficient process. Among the synthesized composites, the PVA/ZnO paper ash (5 wt.%) composite achieved significant antimicrobial efficacy, with inhibition zones of 40 ± 0.01 mm for gram-positive and 37 ± 0.02 mm for gram-negative bacteria. Such an antimicrobial performance surpasses many conventional PVA/ZnO composites. Additionally, the PVA/ZnO paper ash (5 wt.%) composite biodegraded within 40 days and showed excellent renewable properties. The food packaging application of fruit and vegetables was evaluated by monitoring the variation in physical appearance, weight loss rate, and pH conditions.

Also, the antifungal test was assessed through the packaging of bread. The packaging tests revealed that while polyethylene (PE) films allowed quick spoilage due to pathogens, the composite packets maintained food freshness, underscoring its superior antimicrobial properties. Therefore, its improved antimicrobial and food preservation properties indicate that the PVA/ZnO paper ash composite is a promising and practical solution for sustainable and antimicrobial food packaging applications. Highlights: Novel PVA/ZnO paper ash composite. Easy, ecofriendly synthesis of the antimicrobial film by using waste paper as a functional material. High antimicrobial property of PVA/ZnO paper ash. PVA/ZnO paper ash composite as an effective food packaging system. Superior antifungal activity of PVA/ZnO paper ash composite.

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Author keywords- antimicrobial; cellulose; composites; food packaging; PVA; ZnO

Indexing/Quartile

SCOPUS/WOS/Q2

Percentile

69th

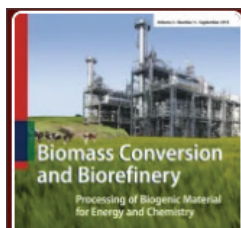
Impact Factor

3.5

SDG

07
AFFORDABLE
AND CLEAN ENERGY

DEVELOPMENT OF PACKAGING FILMS FROM BANANA PSEUDOSTEM SAP AND PVDF: MECHANICAL AND THERMAL PROPERTIES

Muthukumarasamy K.; Kanagarajan B.; Jayachandrabal B.M.; Arul Selvaraj R.C.; Arunprasath K.; **Senthamaraikannan P.***Biomass Conversion and Biorefinery 2025***Dr. P. Senthamaraikannan**Assistant Professor
Alliance School of Applied Engineering

Biomass Conversion and Biorefinery Processing of Biogenic Material for Energy and Chemistry

Publishing model


Hybrid

Abstract

Food processing encompasses the treatment of raw food materials, and the final stage of food processing is packaging, which is essential for preserving food. One major reason of food spoilage is microbial contamination. Significance of packaging in food packaging consists of increased food safety and reduced environmental hazards. This research aimed to address the twin challenges of food preservation and environmental sustainability by creating a novel packaging film using banana pseudostem sap (BPS) and polyvinylidene fluoride (PVDF). This research explored the potential of the BPS as a new bio-based substance to produce films made from PVDF, which improves the mechanical and barrier properties of the film. The maximum film had a thickness of 0.17 mm, water absorption of 50.28% for BSPF 3, and tensile strength of 6.21 MPa. After peaking at 0.7%, the tensile strength began to decrease slightly when the concentration increased from 0.8 to 1.0%. The elongation was 145%, with elongation at break beginning to plateau or decrease slightly after peaking at 0.7%. This indicated that at concentrations higher than 0.7%, the increase in PVDF concentration does not adequately support further elongation, along with a water vapor transmission rate of 5.18% at 50.28%. All these properties imply that the film has a unique combination of high strength, flexibility, and moisture-

resistant properties, rendering it suitable for food packaging applications. This was explained by performing Fourier transform infrared spectroscopy (FTIR) analysis to confirm the chemical composition and compatibility of the polymer (PVDF) and plasticizer (BPS) in the composite film. Characteristic peaks in the FTIR spectra of both materials appeared in the ranges of C – H stretching (3000 cm^{-1}) and C = O stretching (1700 cm^{-1}), showing strong interaction between the two components. The FTIR results showed that PVDF and BPS are well mixed to obtain a film with good mechanical properties. Furthermore, thermogravimetric analysis was conducted to analyze the thermal stability of the film, indicating that the composite film had favorable thermal properties and could withstand environmental conditions in storage and transportation. This innovative packaging solution can be a game-changer in reducing environmental pollution while offering an effective means of meeting the ever-increasing demand for green packing solutions in the food industry, because its potential for improving food preservation and integrating a circular economy concept. © The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2025.

Author keywords- Banana pseudostem sap; Eco-friendly material; Food safety; Packaging; Polyvinylidene fluoride; Shelf life

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------------------|---------------|---|
| SCOPUS/Q1 | 81st | 4.98 |  |

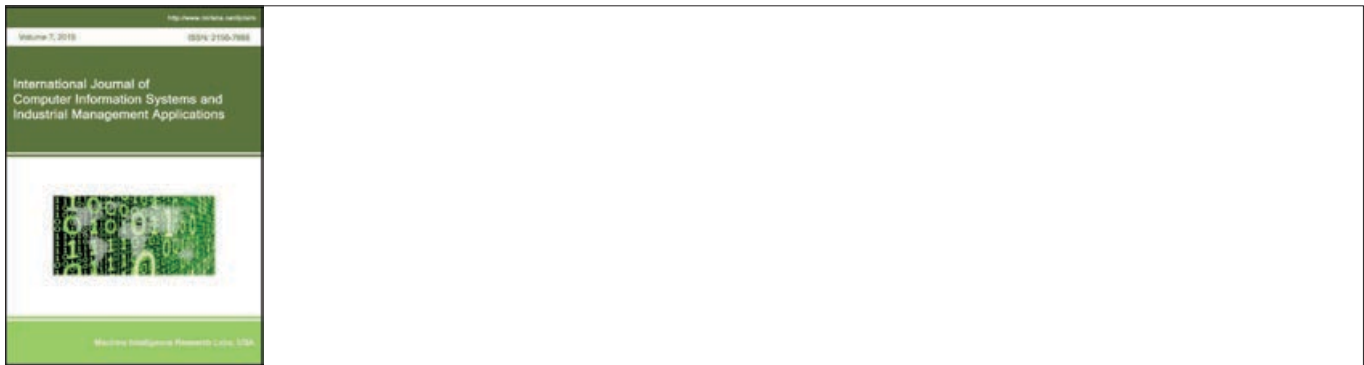
ZERO TRUST MANAGEMENT OVER CONSUMER TECHNOLOGY BASED IOT EDGE NODE FOR SDN COMMUNICATION AND CONTROL OF CYBER-PHYSICAL SYSTEMS

Byeon H.; Alsaadi M.; Gupta S.; **Patni J.C.**; Ahanger T.A.; Singh B.K.; Srivastava A.K.; Abdinabievna P.S.; Boddupalli S. *International Journal of Computer Information Systems and Industrial Management Applications* Volume 17, Pages 143 - 1546 January 2025



Dr. Jagdish Chandra Patni

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Abstract

In response to the lack of effective means for detecting and locating malicious exchange nodes in data flow transmission links within the Internet of Things (IoT), this paper proposes a zero-trust management method for data flow between edge nodes based on software defined networking (SDN) communication and control of cyber-physical systems (CPS). To detect and prevent anomalous behaviors like data tampering, forwarding path anomalies, and malicious packet drops through forwarding verification by exchange nodes, SDN-ZTM applies SDN to the data transmission process between IoT edge nodes. This approach applies the SDN architecture to the transmission process of data flows between edge nodes, utilizing a

fixed-length header overhead for zero-trust management of data flows, nodes, and paths, thereby enabling lightweight packet forwarding verification and malicious exchange node localization. Simulation studies and theoretical research show that SDN-ZTM offers more extensive security features than similar methods. Additionally, SDN-ZTM is a lightweight, useful solution appropriate for IoT application scenarios since it introduces a fixed-length header and has a smaller performance overhead. Experimental results show that the method introduces less than 10% forwarding delay and less than 8% throughput loss. © 1975-2011 IEEE.

Author keywords- Cyber-Physical Systems; Edge Nodes; IoT; SDN-ZTM; Zero Trust Management

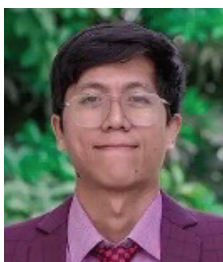
| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------------------|---------------|-----|
| SCOPUS/Q3 | 45th | 1.98 | |



PREDICTION OF COMPRESSIVE STRENGTH, STATIC MODULUS AND WENNER RESISTIVITY FOR NORMAL CONCRETE USING DIFFERENT PERCENTAGES OF RECYCLED CONCRETE AS A COARSE AGGREGATE

Thapa S.; Asha Rani N.R.; Sharma R.P.

Asian Journal of Civil Engineering Volume 26, Issue 5, Pages 2135 – 2152 May 2025 Article number e00663



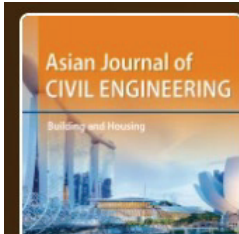
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Asha Rani N.R

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Asian Journal of Civil Engineering

Building and Housing

Publishing model
Hybrid

Abstract

The two most important mechanical properties for concrete are compressive strength and static modulus. Likewise, Wenner resistivity is a crucial durability parameter to be taken into consideration while monitoring the performance of any concrete members. This paper presents novel prediction models for normal concrete's compressive strength, static modulus, and Wenner resistivity based on linear regression models and artificial neural networks (ANN). Due to the quicker rate of output convergence, the study used the Levenberg–Marquardt learning algorithm for the ANN model to forecast the aforementioned parameters. The prediction strength (R^2) of the ANN technique is 14–20% higher than that of the normal regression model, 11–14% higher than that of the static modulus model, and 10–12.5% higher than that of the Wenner resistivity model. For both ANN and linear regression models,

the input parameters considered were the rebound number and pulse velocity. The sample was evaluated by substituting normal stone aggregate (NSA) with varying amounts of recycled concrete aggregate (i.e., 0%, 25%, 50%, 75%, and 100% RCA) as a coarse aggregate. This study considered age (14, 28, and 90 days) and grade (M20, M25, and M30) into consideration while developing the models. Furthermore, by comparing the developed compressive strength model with earlier models created by other authors, the study found that the generated model performed better for RCA specimens. The findings of this investigation will support the application of RCA in the Indian construction sector and promote utilization of natural coarse aggregate more sustainably. © The Author(s), under exclusive licence to Springer Nature Switzerland AG 2025.

Author keywords- Artificial neural network; Compressive strength; Recycled concrete; Static modulus; Wenner resistivity

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|-----|
| SCOPUS/WOS/Q3 | 26th | 1.3 | |



SYNCHRONIZATION OF FRACTIONAL ORDER SUPPLY CHAIN MODEL AND FINANCIAL MODEL

Mishra V.; Maitra S.; Agrawal S.K.

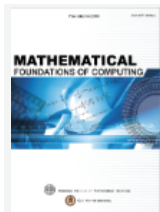
Mathematical Foundations of Computing Open Access Volume 8, Issue 4, Pages 575 - 586 2025



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Dr. Sarit Maitra
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Alliance School of Business



Supports Open Access

Mathematical Foundations of Computing (MFC), provides an interdisciplinary forum to promote interaction among mathematicians, computer scientists and statisticians as well as engineers to exchange new ideas and techniques for attacking the pressing challenges in data analysis. The journal aims to provide a place for more understanding and transparency of data analytics in different areas of AI.

Abstract

A supply chain model's interaction with economic forces can be better understood by integrating a financial model with it. In the present article, a fractional-order financial model is synchronized with the fractional-order supply chain model to understand their interplay. The fractional order supply chain model is used as a drive system, and the fractional order financial model is used as a response system. A nonlinear controller has been designed for the synchronisation of both models. The synchronization of the two dynamical systems

is achieved through the application of the Adams-Bashforth-Moulton method. The synchronisation of these models offers a deeper understanding of the complex interdependencies and highlights potential opportunities and dangers related to the supply chain in the context of supply chain analytics. The findings of this study have important insights into the area of supply chain management and decision making.

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Author keywords- financial system; fractional order; nonlinear controller; stability analysis; supply chain analytics; Synchronisation

OPTIMIZED FREDKIN GATE AND ITS APPLICATION TO DESIGN AN ANCILLA-DELAY-COST EFFICIENT ($2i*j$) REVERSIBLE RAM

Chowdhury B.; **Awasthi S.**; Metya S.K.

Circuits, Systems, and Signal Processing 2025 Article number 129126



Dr. Shashank Awasthi

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Circuits, Systems, and Signal Processing

Publishing model
Hybrid

Abstract

Reversible Computing can boost computational energy efficiency beyond the Landauer limit ($kT\ln 2$) for irreversible bit operations. It holds great potential for future technologies like ultra-low power ICs, quantum-dot cellular automata (QCA), Quantum Computing, and Nanotechnology. So, there is an ongoing pursuit of efficient reversible circuits by optimizing quantum cost, constant inputs (ancilla), garbage outputs and delay, which heavily depends on the assumptions of underlying technology. In this work, we have proposed an optimized version of Fredkin Gate, one of the extensively used reversible gates for realization of almost all basic operations. We have also displayed some efficient designs of all the latches and

flip-flops along with their master slave configurations having optimum performance metrics. The suggested D-FF, being the fundamental block of memory is used to explore the realization of a Reversible Random Access Memory (RRAM) along with a few new arrangements of its constituents like D Flip Flop (D-FF) based write authorized master–slave configuration and reversible decoder. The analysis depicting the comparison states that the new design of RRAM has outsmarted the existing works in terms of performance variables including hardware complexity.

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Author keywords- Master slave; Quantum cost; Reversible decoder; Reversible flip-flop; Reversible logic; RRAM

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q2 | 74th | 2.8 |  |

SUITABILITY ASSESSMENT OF ADINA CORDIFOLIA STEM FIBERS AS REINFORCEMENT IN POLYMER COMPOSITES

Senthamaraikannan P.; Suyambulingam I.; Prithiviraj M.; Vinoth Kumar K.; Guna V.; Kumar R.

Journal of Natural Fibers Volume 22, Issue 12025 Article number 2486804



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Journal of Natural Fibers

 An open access journal

Publishes research in processing natural raw materials, particularly fibers; related lifecycle assessment; sustainable agriculture; bioreclamation.

Abstract

This study explores the feasibility of using Adina cordifolia fibers (ACFs) as reinforcements in thermoset polymer composites. ACFs are primarily composed of cellulose ($58.36 \pm 6.56\%$), hemicellulose ($10.61 \pm 3.38\%$), and lignin ($14.55 \pm 3.55\%$), which exert a unique effect on the properties of the fiber. The presence of cellulose I and II in the ACF was detected through X-ray diffraction analysis, revealing that cellulose II had a crystallinity index (CI) of 32.06% and a crystallite size (CS) of 2.23 nm. ACFs can be used in thermosetting polymer composites as their thermal stability (200°C) and maximum cellulose degradation temperature (336°C) are higher than the processing temperature of thermoset polymers. The elements present on the outer

surface of ACFs were determined by energy-dispersive X-ray spectroscopy (EDAX) analysis, which identified the highest quantities of carbon and oxygen in the fiber, which are related to the cellulose and hemicellulose in the fiber, and minimum amount of other elements such as calcium, potassium, magnesium, and chlorine, which are linked to contamination in the fiber. The results of atomic force microscopy and scanning electron microscopy confirmed the rough surface of the ACF; however, surface modification is needed to remove contamination.

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Author keywords- Adina cordifolia fibers (ACFs); chemical analysis; chemical functional groups; crystallinity index (CI); polymer composites; SEM analysis

Indexing/Quartile

SCOPUS/WOS/Q1

Percentile

80th

Impact Factor

4.8

SDG



INVESTIGATION OF LIGHTWEIGHT PUMICE EPOXY CORE WOVEN BANANA FIBER SANDWICH COMPOSITES

Chenrayan V.; Shahapurkar K.; Kiran M.C.; Bhaviripudi V.R.; Tirth V.; Algahtani A.

Polymer Composites 2025



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Assistant Professor
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**POLYMER
COMPOSITES**

Edited By: Sadhan C. Jana (Executive Editor), Alessandro Pegoretti (Editor-in-Chief)

Online ISSN: 1548-0569

Print ISSN: 0272-8397

Abstract

Substantial agricultural biomass possessing inherent potential for lignocellulosic fiber is discarded as waste post-harvest in developing nations. Natural fibers are the right candidate to replace the synthetic ones to promote a sustainable economy and green environment. The present study concentrates on the fabrication of a core of lightweight pumice particles interspersed among woven banana fiber composites. Epoxy cores were produced by altering the quantity of pumice content (2.5, 5, 7.5, and 10 wt.%) while maintaining a constant woven banana fiber content of 40 wt.%. Composites were processed via the hand layup method. The objective of the effort is to improve the performance of composites by utilizing the distinct qualities of pumice, hence customizing the characteristics of the composite material to satisfy particular application demands. The tensile and flexural qualities improve

with an increase in pumice content in the core, suggesting the advantageous effects of reinforcing pumice to boost the properties. The scanning electron micrographs are analyzed to comprehend the microstructure and its influence on the characteristics. The numerical simulation results are employed to corroborate the study's conclusions. The numerical results align well with experimental observations, exhibiting a 3% reduction in accuracy. Highlights: Sandwich composites fabricated with pumice/epoxy core and woven banana fibers. Tensile and flexural characteristics are examined and simulated. Pumice affects the flexural and tensile characteristics of composites. Flexural modulus and strength exhibit considerable improvement with an increase in pumice content.

© 2025 Society of Plastics Engineers.

Author keywords- flexural; pumice; sandwich composites; simulation; tensile; woven banana fiber

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|-----|
| SCOPUS/WOS/Q2 | 58th | 1.9 | |



THE EMERGENCE OF ELECTRIC FIELD-DRIVEN MAGNETIZATION REVERSAL IN CoFe₂O₄/ZnO HETEROSTRUCTURE

Guchhait S.; **Aireddy H.**; Kander N.S.; Das A.K.

Physica Status Solidi (A) Applications and Materials Science 2025



Dr. Harinath Aireddy

Associate Professor & Director (In Charge) - Centre of Excellence (Additive Manufacturing),
Director - Centre of Excellence (Maker Space)
Alliance School of Applied Engineering



Volume 222, Issue 13
July 2025
2401018

Abstract

The CoFe₂O₄/ZnO (CFO/ZnO) epitaxial heterostructure is grown on a silicon substrate by pulsed laser deposition system and the electric field-controlled magnetization reversal in CFO/ZnO heterostructure is studied using an indigenously developed optical cantilever beam magnetometer setup. The magnetization (M) of the top CFO layer has been reversed via electrostrictive strain generated due to the application of dc electric field (E) across the thickness of the bottom ZnO layer. A butterfly-like compressive hysteresis loop has appeared in the case of magnetization versus electric field plot where the saturation magnetization is found to be -45 MA m^{-1} . The

emergence of a butterfly-shaped M–E curve signifies that the strain-mediated magnetoelectric (ME) coupling takes place between the magnetization (M) of the top CFO layer and the polarization (P) of the bottom ZnO layer. Moreover, the variation of the ME coupling coefficient () with the electric field is presented and the maximum value of $= -1.44 \times 10^{-6} \text{ s m}^{-1}$ from the corresponding curve is obtained. The realization of the electric field-driven magnetization reversal in CFO/ZnO heterostructure is thought to be a very promising aspect in developing energy-efficient novel spintronic and neuromorphic devices. © 2025 Wiley-VCH GmbH.

Author keywords- cantilever beam magnetometer; CoFe₂O₄/ZnO epitaxial heterostructures; converse magnetoelectric effects; magnetoelectric coupling; multiferroics; spintronic

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q1 | 81st | 4.98 |  |

REAL-TIME THREAT DETECTION AND AI-DRIVEN PREDICTIVE SECURITY FOR CONSUMER APPLICATIONS

Thayalan S.; **Radhakrishnan N.**; Ramana T.V.; Devarajan G.G.; Karuppiyah M.; Dabel M.M.A
IEEE Transactions on Consumer Electronics 2025



Dr. R. Niranchana
 Assistant Professor
 Alliance School of Advanced
 Computing

Real-Time Threat Detection and AI-Driven Predictive Security for Consumer Applications

Publisher: **IEEE** [Cite This](#) [PDF](#)

Sugirtha Thayalan ; Niranchana Radhakrishnan ; T V Ramana ; Ganesh Gopal Devarajan ; Marimuthu Karuppiyah ; Maryam M. Al Dabel

Abstract

The growing use of artificial intelligence (AI) in consumer applications, especially through smart devices and the Internet of Things (IoT), presents both opportunities and security challenges. Protecting user data and privacy is increasingly critical as these technologies become part of daily life. Traditional security models struggle with the large, real-time data generated by these systems, leading to problems with accuracy, scalability, and threat detection. To address this, we propose a novel framework that combines Collaborative Federated Learning with an edge-cloud architecture for predictive security. Our approach features the Two-Stage Attention Integrated Graph-based Multi-source Spatio-Temporal Data Fusion (2S-AGMSTDF) network, which processes multiple

data sources, including sensor inputs, cyber activity, and user behavior patterns. Key components include AKGCN for cyber feature embedding, a GCN-ResNet-based transformer (GRCMT) for spatial data analysis, and an Attention-Based LSTM for temporal feature extraction. By performing local computations at the edge for real-time monitoring and using Federated Averaging at the cloud level, our framework improves accuracy, scalability, and privacy. Real-world evaluations show its superior performance in anomaly detection and predictive security compared to existing methods, offering a robust AI-driven solution for consumer security.
 © 1975-2011 IEEE.

Author keywords- AI-driven Security; Blockchain Network; Federated Learning; IoT Security; Smart Devices

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------------------|---------------|-----|
| SCOPUS/Q3 | 31st | 0.6 | |



USING FEDERATED LEARNING FOR DETECTING AUTISM IN CHILDREN

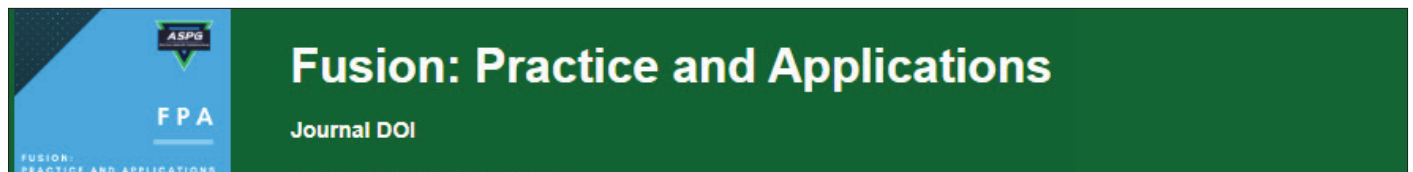
Kranthi M.; **Debnath S.**; Priyadharsini; Venkatesan R.

Fusion: Practice and Applications Volume 19, Issue 2, Pages 211 – 223 2025



Dr. Saswati Debnath

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Computing



Abstract

Identifying Autism early in children is vital for ensuring more precise developmental support and effective therapeutic interventions. Traditional diagnostic approaches are frequently delayed, and data privacy concerns limit the availability of broad, multi-institutional datasets required for effective machine learning models. To address these limitations, this study proposes a CNN-LSTM-based autism detection model for children using Federated Learning (FL). In the model, temporal and spatial information is extracted from the facial CNNs are highly adept at using convolutional filters to extract spatial features from images. LSTM networks are a specific type of Recurrent Neural Network (RNN) that is ideal for processing time-series or sequences because it can identify long-term relationships in sequential data. This architecture uses CNN layers to extract spatial information from important indications that are important for detecting ASD, like eye

patterns, gestures, and facial expressions. After that, these features are sent to LSTM layers, which examine the time-dependent and sequential behavioral patterns associated with autism. Federated Learning allows the locally to train the model on its own dataset locally, sharing only model updates with a central server, thereby preserving data privacy while promoting diverse data contributions. According to experimental results using the proposed techniques, the federated CNN-LSTM model performs 4.3% better than the conventional centralized models because it has less overfitting and is more resilient to a range of data distributions. The model's performance metrics further highlight its reliability, accuracy, precision, recall, and F1-Score values reaching 98.90%, 97.80%, 98.05%, and 98%, respectively, showing its potential for reliable ASD detection in children across diverse populations. © 2025, American Scientific Publishing Group (ASPG). All rights reserved.

Author keywords- Autism; Children; Convolutional Neural Networks; Federated Learning; Long Short-Term Memory

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q2 | 65th | 8.97 |  |

IMAGE-BASED HEMODYNAMIC AND RHEOLOGICAL STUDY OF PATIENT'S DISEASED ARTERIAL VASCULATURES USING COMPUTATIONAL FLUID DYNAMICS (CFD) AND FLUID–STRUCTURE INTERACTIONS (FSI) ANALYSIS: A REVIEW

Athani A.; Ghazali N.N.N.; Badruddin I.A.; Usmani A.Y.; Amir M.; **Singh D.**; Khan S.H.

Archives of Computational Methods in Engineering Volume 32, Issue 3, Pages 1427 – 1457 April 2025



Dr. Digamber Singh

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Archives of Computational Methods in Engineering

State of the Art Reviews

Abstract

Vascular diseases, such as aneurysms and stenosis, significantly impact hemodynamic parameters and disrupt the structural integrity of the arterial layer. Computational Fluid Dynamics (CFD) simulations in realistic arteries with wall interactions can detect stenosis formation by identifying altered flows and variations in wall shear stresses. This review article aims to highlight the significance of CFD simulations in finding the evolution of arterial diseases based on CT (Computed tomography) scan images of actual patient data. Each article was evaluated based on various hemodynamic parameters, inflow pulsatile waveform nature, and blood rheological models, including Newtonian and Non-Newtonian. The review provides the outcomes of studies involving fluid and structure interactions. The challenges of CFD and Fluid–Structure Interaction (FSI) simulations are discussed using results derived

from patient-specific CT scan data. Different anatomical vessels reconstructed using medical images, and various inflow and outflow boundary conditions being applied to simulate the flow in these models and wall interaction with the fluid domain have been reported to analyze the flow behavior and predict arterial wall diseases. The article will be helpful to researchers and surgeons in analyzing diseased patient and developing a non-invasive-based system. The study emphasizes the potential of CFD simulations for identifying vascular diseases and predicting their evolution based on CT scan images of actual patient data. Additionally, the article highlights the need for more research to address the challenges associated with CFD and FSI simulations.

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Author keywords- Vascular diseases, Computational Fluid Dynamics (CFD), Fluid–Structure Interaction (FSI), Wall shear stress, CT scan images, Hemodynamic parameters, Patient-specific modeling, Blood rheology

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|-----------------------|---------------|-----|
| SCOPUS/Q4 | 3rd | NA | |



ROLE OF FINANCIAL STRESS IN THE FINANCIAL WELL-BEING OF SMALL BUSINESS OWNERS

Thangaraj R.; Suhashini J.; Nagouda S.S.; Smitha S.; Muthulakshmi P.

Multidisciplinary Reviews Volume 8, Issue 9 September 2025 Article number e2025265



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Alliance School of Business

Multidisciplinary Reviews

Abstract

Financial stress adversely impacts well-being by affecting mental and emotional health, decision-making, physical health, relationships, work performance, and long-term planning. It leads to anxiety, poor choices, health issues, strained relationships, reduced productivity, and hindered future planning. Addressing financial stress through financial planning and financial education can improve overall financial well-being. This study investigates how digital financial inclusion (DFI) acts as a mediator between financial vulnerability (FV) and financial wellbeing (FWB) for small business owners in Bangalore, India. The research identifies important factors that cause differences in FV including marital status, education, and business type. Conversely, gender, age, and income have no significant statistical relevance in explaining the differences in FV. The DFI is significantly explained by age, income, and business characteristics, whereas gender, marital status, and education

have no significant effect on the DFI. Furthermore, age, income, business type, and nature cause differences in FWB, whereas gender and education do not. The research reveals a significant positive relationship between FV and DFI (0.263), suggesting that higher levels of digital financial inclusion can slightly decrease financial vulnerability slightly. A moderate relationship (0.314) between FWB and FV indicates that enhanced financial well-being results in reduced financial vulnerability. The DFI is also strongly correlated (0.780) with FWB, emphasizing its crucial role in improving financial well-being. DFI plays a significant mediating role between FV and FWB, with a total effect of 0.4872 and an indirect effect of 0.3449. The study emphasizes the significant role of DFI in enhancing the financial stability and prosperity of small business proprietors, with a VAF of 70.79%.

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Author keywords- digital financial inclusion; financial vulnerability; financial wellbeing; small business owners

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q1 | 91st | 7.2 |  |

PROGRESS IN THERMALLY CONDUCTING ELASTOMER NANOCOMPOSITES AND HYBRID NANOCOMPOSITES: A COMPREHENSIVE REVIEW

Hegde M.; Chandrashekar A.; Gopi J.A.; **Parameswaranpillai J.**; Prabhu T.N.; Kotresh T.M.

Applied Materials Today Volume 44 June 2025 Article number 102727



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APPLIED
materialstoday



Abstract

Enhancing the thermal conductivity of elastomers using conducting nanofillers is an active area of study, particularly in fields such as thermal interface materials, electronic packaging, batteries, portable electronic devices, high-speed dynamic elastomeric products, anti-tracking and anti-erosion insulators for transmission lines, and liquid cooling garments. Phonon transport is the primary heat transfer mechanism in elastomer nanocomposites. This article discusses various processing techniques and surface functionalization methods for achieving proper filler orientation and dispersion, morphology, and network formation in thermally conducting elastomeric

nanocomposites, which are crucial for Phonon transport. It reviews the usage of multiple fillers with different morphologies in elastomer, which generates hybrid composites with a co-continuous thermal conducting network that synergizes the thermal conductivity and profoundly affects the manufacturing of advanced materials. Additionally, this review summarizes potential areas where thermally conducting elastomer nanocomposites can be applied over conventional materials while addressing existing challenges and prospects.

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Author keywords- Elastomer; Graphene; Hybrid nanocomposites; Nanocomposites; Nanotube; Thermal conductivity

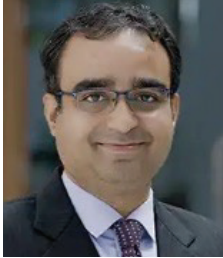
| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------------------|---------------|-----|
| SCOPUS/Q2 | 73rd | 0.636 | |



BIBLIOMETRIC ANALYSIS OF BANKING FRAUDS AND SCAMS LITERATURE

Shukla A.; Kashni T.

Journal of Financial Crime Volume 32, Issue 3, Pages 729 - 75027 March 2025



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International Conference on MULTIDISCIPLINARY APPROACHES FOR SUSTAINABLE DEVELOPMENT IN SCIENCE & TECHNOLOGY

Abstract

Purpose: This paper aims to undertake an evaluation of the research development and works associated with banking frauds and scams. Design/methodology/approach: The authors have conducted bibliometric analysis of 288 studies on issues of banking frauds and scams, published up to August 4, 2024 using Scopus and the VOS viewer software. Findings: This study disseminates top influential authors, countries, journals, papers, funding institutions and affiliations relating to banking frauds and scams. Generally, although a great deal of work

has been accomplished in this area, there are prominent gaps in such findings. Originality/value: To the best of the authors' knowledge, this paper is the first comprehensive review of extant research relating to banking frauds and scams. It hence represents an original piece of work in applying bibliometric analysis to this topic area, offering valuable insights for practitioners and academics who seek to understand more about banking frauds and scams risks.

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Author keywords- Banking frauds; Banking scams; Bibliometric analysis; Cybersecurity; Financial crime; Risk management

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|--|
| SCOPUS/WOS/Q2 | 59th | 2.4 |  09 INDUSTRY, INNOVATION AND INFRASTRUCTURE |

ORMOSIL: ADVANCED CATALYTIC APPLICATION IN ORGANIC SYNTHESIS

Jaswal N.; Aman; **Bahadur V.**; Kumar P.

Journal of the Iranian Chemical Society 2025



Dr. Vijay Bahadur

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Journal of the Iranian Chemical Society

Abstract

Organically modified silicate (ORMOSIL) materials have emerged as highly efficient catalysts in advanced organic synthesis due to their hybrid nature, which combines the structural stability of silica with tunable organic functionalities. Their versatility has driven significant advancements in various catalytic applications. In heterogeneous catalysis, ORMOSIL-based catalysts offer high surface area, stability, and reusability, facilitating efficient interactions with reactants and improving reaction rates and selectivity. Moreover, in acid–base catalysis, functionalization with acidic (e.g., sulfonic acid) or basic (e.g., amine) groups enables transformations such as aldol condensation, esterification, and transesterification with enhanced efficiency and recyclability. Additionally, ORMOSIL plays a crucial role in asymmetric synthesis by serving as a robust support for chiral catalysts, improving enantioselectivity and stability in reactions such as asymmetric hydrogenation. Its porous structure makes it an excellent

material for enzyme immobilization, preserving enzymatic activity and promoting sustainable biocatalytic transformations. Furthermore, ORMOSIL-based photocatalysts, often combined with metal or semiconductor nanoparticles, exhibit enhanced light absorption and charge separation, making them highly effective in oxidative and reductive photocatalytic reactions. In electrocatalysis, ORMOSIL enhances catalyst stability and conductivity, facilitating redox reactions in electrochemical organic synthesis, including applications in fuel cells. The integration of ORMOSIL with nanomaterials and other catalytic components has led to the development of multifunctional catalytic systems with superior performance, selectivity, and sustainability. This review provides an in-depth exploration of these advanced catalytic applications, highlighting recent progress and future prospects in ORMOSIL-based catalytic systems for organic synthesis.

© Iranian Chemical Society 2025.

Author keywords- Electrocatalyst; Heterogeneous catalyst; Modified silicate; Nanomaterials; ORMOSIL; Photocatalysts

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q2 | 51st | 2 |   |

HOLISTIC FRAMEWORK FOR OPTICAL NETWORK EFFICIENCY: LOGICAL TOPOLOGY REVAMPING IN THE PRESENCE OF DYNAMIC TRAFFIC DEMAND FOR RING PHYSICAL TOPOLOGY NETWORKS

Mishra, V, Gajjar, SB;

JOURNAL OF OPTICS-INDIA



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Journal of Optics

Publishing model
Hybrid

Abstract

This study investigates the optimization of lightpath selection and traffic management in Wavelength Division Multiplexing (WDM) networks with a Ring topology. By employing the Heuristic Adaptation Algorithm (HAA) and Yen's K-Shortest Path Algorithm, we propose a dynamic traffic allocation framework tailored to the unique characteristics of Ring topology. The framework effectively optimizes key performance metrics such as energy consumption, throughput, packet delivery ratio, and congestion levels under both slow-changing and fast-changing traffic scenarios. The integration of a Multilayer Perceptron

(MLP) model significantly enhances the predictive accuracy of performance metrics, achieving a correlation coefficient of 0.9972, with minimal errors (Mean Absolute Error: 2.8444; Root Mean Squared Error: 5.0271). The results reveal that the proposed framework achieves a 92.5% lightpath utilization rate while maintaining high energy efficiency, even with increasing traffic demand. The findings emphasize the trade-offs between clockwise and counterclockwise routing in Ring networks, offering a cost-effective and scalable solution for dynamic traffic environments.

Author keywords- Wavelength division multiplexing (WDM), Logical topology revamping

| | | | | | | |
|----------------------|-----------------------|---------------|-----|-----------------------------------|---|--|
| Indexing/Quartile | Percentile | Impact Factor | SDG | 07 AFFORDABLE AND CLEAN ENERGY | 09 INDUSTRY, INNOVATION AND INFRASTRUCTURE | 11 SUSTAINABLE CITIES AND COMMUNITIES |
| SCOPUS/WOS/Q4 | 7th | 1.1 | | | | |

WEAR AND HARDNESS OF MULTIDIRECTIONALLY FORGED SILICON CARBIDE REINFORCED ZA27 ALLOY COMPOSITE MATERIALS

B. M. Girish, B. M. Satish

MATERIALS PERFORMANCE AND CHARACTERIZATION. Apr 2025, 14(1): 26-34



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April 2025, Volume 14, Issue 1

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MPC is ASTM's premier materials journal, covering theoretical and practical aspects of the structure, processing, properties and performance of a wide range materials. [Read more...](#)

Richard W. Neu
Georgia Institute of Technology

Impact Factor

1.1

Abstract

The goal of the current study is to determine how the wear and hardness parameters of 5 % silicon carbide reinforced ZA27 alloy composites are impacted by multidirectional forging (MDF). The composites were made using stir casting, a liquid metallurgy process. Under stresses of 1.10, the MDF process was applied to composite samples at 200°C, and 1,000 rpm was used as the counter disc rotation speed during the wear experiment, which was performed using pin-on-disc wear test equipment. In this investigation, wear test was conducted using sliding distances of 1,000, 1,500, and 2,000 m with weights of 30, 40, 50, and 60 N. The sample was examined

using scanning electron microscopy (SEM) to study the worn surfaces. Investigation results demonstrated that MDF composites wore out far less frequently than non-MDF materials. At a load of 40 N and sliding speed of 1.25 m/s, the non-MDF sample showed a wear rate of 149 mg/m, whereas the MDF sample showed a wear rate of 138 mg/m. With an increase in applied load but a drop in speed, the wear rates of the matrix alloy and composites both increase. At low loads, the composite specimens showed abrasion wear, but at high loads, delamination wear was discovered to be more prevalent.

Author keywords- multidirectional forging , pin-on-disc, liquid metallurgy, abrasion wear

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q3 | 49th | 2.1 |   |

NONLINEAR STABILITY ANALYSIS OF MULTI-STIFFENED LAMINATED COMPOSITE PLATES UNDER UNIFORM IN-PLANE HARMONIC LOADING

Danish Fayaz & S. N. Patel,

Journal of Vibration Engineering & Technologies, Volume 13, article number 270, (2025)



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Journal of
Vibration
Engineering &
Technologies

Journal of Vibration Engineering & Technologies

Publishing model
Hybrid

Abstract

When an in-plane harmonic loading is applied to a plate, the linear dynamic instability region (DIR) formed, gives only the range of frequencies where the plate becomes unstable, however, it doesn't give any information about the transverse deformations. Hence, a nonlinear time history analysis is required to capture the actual time-varying deformations along with the nonlinear frequency response analyses to capture the actual frequency-varying deformations in the dynamic instability zone.

In this study, a nonlinear mathematical model is developed within the finite element framework to analyze both the nonlinear frequency response and the time-history behavior of laminated composite plates attached with composite laminated stiffeners. The plates are subjected to time-dependent (harmonic) in-plane edge loading. An isoparametric finite element formulation is used to model the plate and stiffener components. To gain a comprehensive understanding of the

instability characteristics of the stiffened plates, the Newmark-method is employed for solving the linear and nonlinear dynamic equilibrium equations. Furthermore, the Incremental Harmonic Balance (IHB) method is utilized to trace the nonlinear frequency response path of the stiffened system. The results show that the dynamic responses under linear theory become unbounded within the DIR due to the lack of stabilizing mechanisms. Nonlinear theory introduces displacement-dependent restoring forces and geometric nonlinearities, which produce stabilizing effects and result in bounded periodic responses. Increasing the stiffener count enhances plate stiffness, causing the dynamic instability region to shrink and shift toward higher frequencies. This leads to reduced vibration amplitudes and improved stability across a wider frequency range. Overall, the nonlinear dynamic responses remain bounded and stable, demonstrating the system's increased resilience to dynamic excitations.

Author keywords- transverse deformations, element framework, instability, stiffened system

| Indexing/Quartile | Percentile | Impact Factor | SDG | 07 AFFORDABLE AND CLEAN ENERGY | 09 INDUSTRY, INNOVATION AND INFRASTRUCTURE | 11 SUSTAINABLE CITIES AND COMMUNITIES |
|----------------------|------------------------|---------------|-----|--------------------------------------|---|---|
| SCOPUS/WOS/Q3 | 48th | 3.4 | | | | |

ASSESSING HUMAN HEALTH RISKS: IMPACT OF VARIABLE AIR QUALITY INDEX ON ASYMMETRIC SPIROMETRY FLOW

Digamber Singh & Abdullah Y. Usmani

Air Quality, Atmosphere & Health, 05 May 2025



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Air Quality, Atmosphere & Health

An International Journal

Publishing model
Hybrid

Abstract

The escalation of occupational and environmental pollutants poses a significant threat to human health, particularly exacerbating chronic respiratory diseases (CRD). Globally, CRD account for 4.0 million reported deaths (Momtazmanesh et al. *EClinicalMedicine* 59, 2023). This study investigates the repercussions of exposure to unfavourable Air Quality Index (AQI) levels on respiratory health, focusing on asymmetric spirometry flow during natural inspiration at a flow rate of $Q_{in} = 10$ l/min. Here, employing digital imaging techniques, we developed an in-silico human respiratory tract model, encompassing up to the 7th bifurcation of a healthy male individual. The results reveal that the dynamics of inspired airflow and particles, particularly in turbulent regions, influence particle deposition in the airways. Thus, the upper airways and bifurcations region have higher deposition efficiency of fine

particles ~ 2.5 and $10 \mu\text{m}$, consequently creating hotspots for respiratory illnesses. Moreover, to quantify the internal flow characteristics, we utilised a set turbulence model, and the trajectory of fine particles was computed by discrete phase model (DPM). The localised quantitative quantification of particle physics focuses on deposition efficiency at different time instants, $t = 1.5$ s, 2.1s and 2.5 s, complemented by insights into internal flow features, particles are depicted and quantified through regional deposition efficiency, while flow physics is presented by, surface streamlines, turbulent kinetic energy, turbulence intensity and Q-criterion. These findings have a significant implication in effective diagnosis and management of chronic respiratory diseases (CRD), providing valuable insights into the intricate interplay between air quality, airflow dynamics, and respiratory health.

Author keywords- Chronic Respiratory Diseases (CRD), Air Quality Index (AQI), Particle Deposition, Turbulence Model, In-silico Respiratory Model, Digital Imaging Techniques, Deposition Efficiency, Turbulent Kinetic Energy

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q2 | 74th | 2.8 |    |

CHARACTERIZATION OF FICUS BENJAMINA L. AERIAL ROOT FIBER REINFORCED POLYESTER COMPOSITE

Indran Suyambulingam, P. Senthamaraikannan; M. Sergius Joe, D. Prince Sahaya Sudherson, R. Kumar,
Journal of Natural Fibers, Volume 22, 2025, Article: 2475158 , 14 Mar 2025



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Journal of Natural Fibers

 An open access journal



Publishes research in processing natural raw materials, particularly fibers; related lifecycle assessment; sustainable agriculture; bioreclamation.

Abstract

The aerial root of *Ficus benjamina* L. was reinforced with polyester-based bio-composites that were fabricated using the manual lay-up cum compression method. The composite's mechanical, thermal, and fractographical properties were investigated using tensile, hardness, impact, water absorption, thermo gravimetric analysis, and scanning electron microscopy analysis. Mechanical behaviors of the composites are enhanced by up to 30% when the weight percentage of *Ficus benjamina* L. root fiber (FBRF) is utilized. A significant

decrease occurs at these values as the fiber content rises. The composite's hardness is proportional to the fiber loading. Thermo gravimetric analysis shows that FBRF addition raises the transition temperature, while pure composites lower it. The composites had an excellent water absorption property, compatible, and strong. Tensile fractograph exhibited homogeneous dispersion and increased fiber adherence at 30wt. %. The findings show the potential of FBRF and their green composite applicability.

Author keywords- Biomass, biofiber, *Ficus benjamina* L., root fibernatural ,fiberpolymer composite

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q3 | 31st | 0.8 |   |

ON THE APPLICABILITY OF FEYNMAN-KAC PATH INTEGRAL SIMULATION TO SPACE-TIME FRACTIONAL SCHRÖDINGER EQUATIONS

Sumita Datta, Radhika Prosad Datta and James M. Rejcek

Monte Carlo Methods and Applications, April 26, 2025



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Monte Carlo Methods and Applications

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Language: English

First published: January 1, 1995



Publication Frequency: 4 issues per year

Abstract

In this study, we explore the applicability of the Feynman–Kac (FK) path integral formula to space-time fractional Schrödinger equations. In this work, a FK method based on the Lévy measure has been proposed for solving the Cauchy problems associated with the space-time fractional Schrödinger equations arising in interacting quantum systems. Application of an uncoupled Continuous Time Random Walk (CTRW) model with an exponentially distributed waiting time makes the underlying stochastic process a Lévy process which is basically a generalized Wiener process. Since these processes are

Markovian in nature we can adopt the classical FK approach to simulate the CTRW model for solving the space-time fractional diffusion process with comparable simplicity and convergence rate as in the case of standard diffusion processes. Our findings underscore the viability of employing the Fractional Feynman–Kac path integral technique as an effective numerical method for solving space-time diffusion equations, thereby offering a promising alternative to traditional fractional calculus approaches.

Author keywords- Feynman–Kac path integral method; Lévy process; Riesz derivatives; continuous time random walk; Caputo derivatives

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q1 | 95th | 2.2 |   |

AN ORTHOGONAL POLYNOMIAL SOLUTION TO THE CONFLUENT-TYPE HEUN'S DIFFERENTIAL EQUATION

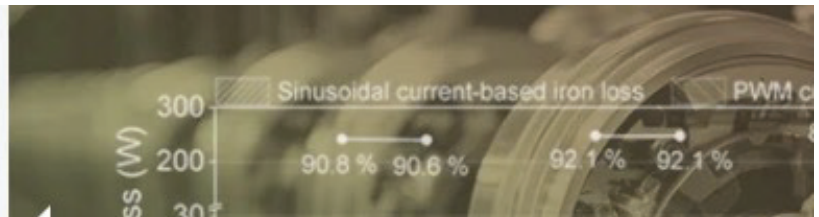
Varun Kumar,; Saiful R. Mondal and,
Mathematics 2025



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Abstract

In this work, we present both analytical and numerical solutions to a seven-parameter confluent Heun-type differential equation. This second-order linear differential equation features three singularities: two regular singularities and one irregular singularity at infinity. First, employing the tridiagonal representation method (TRA), we derive an analytical solution expressed in terms of Jacobi polynomials. The expansion coefficients of the series are determined as solutions to a

three-term recurrence relation, which is satisfied by a modified form of continuous Hahn orthogonal polynomials. Second, we develop a numerical scheme based on the basis functions used in the TRA procedure, enabling the numerical solution of the seven-parameter confluent Heun-type differential equation. Through numerical experiments, we demonstrate the robustness of this approach near singularities and establish its superiority over the finite difference method.

Author keywords- continuous Hahn polynomials; confluent Heun's differential equation; tridiagonal representation; recurrence relation; orthogonal polynomials; finite difference method; stability

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|----------------------|------------------------|---------------|---|
| SCOPUS/WOS/Q1 | 90th | 5.1 |   |

Sr²⁺ DOPING-INDUCED CHANGES IN STRUCTURAL, MAGNETIC, AND DIELECTRIC PROPERTIES OF FERRIMAGNETIC YTTRIUM IRON GARNET

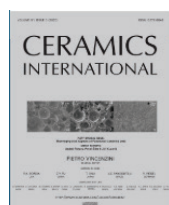
Vineet Sahu , Kumud Dubey, Shubha Dubey, Pankaj Soni , Anchit Modi , Devendra K. Pandey, **Deepshikha Rathore**, N.K. Gaur,

Ceramics International Volume 51, Issue 9, April 2025



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Ceramics International

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9.4

CiteScore

5.1

Impact Factor

Abstract

This study analyses the impact of Strontium (Sr) doping on the structural and physical properties of Yttrium Iron Garnet Y₃Fe₅O₁₂ (YIG). The polycrystalline Y_{3-x}Sr_xFe₅O₁₂ (x = 0.00, 0.05, and 0.10) specimens were synthesised via the solid-state reaction technique. X-ray diffraction with Rietveld refinement indicated that the compound crystallises in the cubic phase with an Ia3d space group. The doping has caused an increase in lattice volume due to lattice expansion. The FTIR and Raman spectra supported the monophase composition and indicated a linear trend of lattice expansion upon doping. XPS spectrum investigation confirmed the existence of multivalent states of Fe, which convert equivalently into the Fe⁴⁺ state upon doping. The magnetic hysteresis revealed its soft ferrimagnetic characteristics. The augmentation of double-exchange

interaction from hole doping has led to a substantial rise in saturation magnetisation, reaching a peak value of 27.05 emu/g at a concentration of x = 0.1, so rendering it a feasible choice for the magnetic cores of electromagnets. The ferroelectric hysteresis loop demonstrated the resistive characteristics of YIG, marked by a decrease in polarisation due to the suppression of Fe²⁺ states. The dielectric investigation revealed the relaxation characteristics of YIG. Divalent doping has also resulted in a decrease in both the dielectric constant and the loss factor. This study will introduce an effective technique for producing high-performance YIG ferrite that meets the requirements of miniaturisation and integration.

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Author keywords- Dielectric; Ferroelectric; Magnetisation; Mossbauer; XPS; YIG



Scopus

**CONFERENCE PAPERS,
BOOK CHAPTERS, BOOKS
AND EDITED BOOKS**

INTEGRATING SUSTAINABILITY IN INDIA'S TOURISM SECTOR: AN UPHILL BATTLE**Misra, Apoorvaa**; Keerthirajb, c*Sustainable Business Ecosystems and Social Perspectives Pages 359 - 38514 March 2025***Dr. Apoorva Mishra**Assistant Professor
Alliance School of Law**Sustainable Business Ecosystems and Social Perspectives****Abstract**

This chapter investigates the complex relationship of sustainability with the tourism sector in India and such related challenges and strategies for integrating these practices. The concept of growth in India is very rapid for tourism development; though this is economically rewarding, it has therefore led to tremendous environmental and social problems, particularly in the ecologically sensitive areas. The chapter will scrutinize a range of important legislative instruments along with policy documents to evaluate how far these have been successful in promoting the cause of

sustainability. This chapter helps find out the barriers toward the implementation of sustainable tourism practices through the case studies and conveyed literature. It provides suggestions so that the tourism practices can be aligned with Sustainable Development Goals, especially SDG 8. Insights presented in the chapter will add up to making the tourism sector development in India sustainable and resilient in the long run so that benefits for all-environment and local communities-from it.

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| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------|---------------|-----|
| SCOPUS/NA | NA | NA | |



HARNESSING ETHICAL AI: MEASURES OF REDRESSING HATE SPEECH IN THE SOCIAL MEDIA CONTEXT

Wani S.A.; Mansoor S.I.U.;

Ethical AI Solutions for Addressing Social Media Influence and Hate Speech Pages 37 - 617 March 2025, Pages 37 - 617 March 2025



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Ethical AI Solutions for Addressing Social Media Influence and Hate Speech

Abstract

As communication technology advanced Social media came in as means and platform of deliberation and connection wherein at the same time it opened doors for hate speech and toxic content. In this chapter, the author discusses moderation of ethical AI and hate speech in today's social media context that is increasingly becoming more polarized. Hate speech is not only an issue of some concern to users of technology but it is also a global concern in the current society especially since it affects social harmony, human rights, and freedom of speech and

press thus the need to have an anti-hate speech technology with strong ethical backing. This Chapter focuses on the concept of Hate Speech from the legal, ethical and social aspects within and its effects on society and individuals. It considers how hate speech circulates, how it works by analysing sophisticated methods that include, the functions and procedure performed by algorithms, processes such as echo chambers, and the principles of things going viral.

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Indexing/Quartile

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NA



SENTIMENT AND EMOTION ANALYSIS USING MACHINE LEARNING TECHNIQUES

Rajagopal R.; Reddy B.A.; Nayak U.A.; Srinivasan S.; Angela Jean Mary E.; Chauhan A.;

Exploring Psychology, Social Innovation and Advanced Applications of Machine Learning Pages 173 - 1906 March 2025



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Exploring Psychology, Social Innovation and Advanced Applications of Machine Learning

by Maria E. Raygoza-I. (Editor), Jesus Heriberto Orduo-osuna (Editor), Abelardo Mercado-herrera (Editor), & 2 more

Abstract

Sentiment analysis and text emotion identification have grown in prominence due to their wide range of applications in fields such as psychology, artificial intelligence, human-computer interaction, and so on. There are numerous Machine Learning approaches available for emotion recognition and sentiment analysis. The chapter also delves into the key procedures of data collecting, preprocessing, and emphasising the necessity of good data in training effective models. Real-world applications from a variety of disciplines, including business, healthcare, and entertainment, are investigated to demonstrate

the practical utility of these strategies. The chapter also covers the issues of ambiguity, context-awareness, and cross-linguistic disparities, as well as providing suggestions for future study paths. This chapter provides a detailed exploration of machine learning approaches to sentiment and emotion analysis, making it a valuable resource for researchers, practitioners, and students interested in using machine learning to understand and interpret emotional content in textual data.

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| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------|---------------|-----|
| SCOPUS/NA | NA | NA | |



CONSUMER BEHAVIOR PREDICTION USING MACHINE LEARNING ALGORITHMS

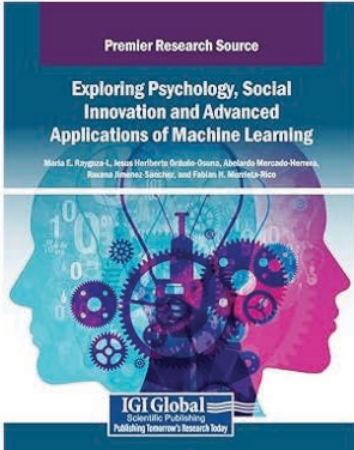
Rajagopal R.; Akram N.; Aravindhana K.; Sujatha K.; Khan S.A.; Singh G.;

Exploring Psychology, Social Innovation and Advanced Applications of Machine Learning Pages 109 - 1306 March 2025




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Exploring Psychology, Social Innovation and Advanced Applications of Machine Learning

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Abstract

The chapter reviews consumer behavior fundamentals such as purchasing decision criteria, quantification, and analysis. Next, it discusses decision trees, ensemble approaches, neural networks, regression analysis, and support vector machines for customer behavior prediction. Each algorithm's technique, merits, and weaknesses are examined. We then show how these algorithms can predict purchase intent, customer turnover, life cycle value, and other consumer behaviors. This setting presents challenges when using machine learning

models, including data quality, model interpretability, and the ethics of using consumer data. The industry's current and future innovations, such as AI-driven personalization and deep learning to understand client behavior, are also highlighted.

This chapter explores the intersection of machine learning and consumer behavior analysis to help researchers, data scientists, and business professionals acquire more accurate and valuable consumer insights.

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| SCOPUS/NA | NA | NA | | |

CRIMINAL JUSTICE SYSTEM IN THE AGE OF ARTIFICIAL INTELLIGENCE: EXPLORING RIGHTS, RISKS, AND RESPONSIBILITIES IN THE DIGITAL ERA

Wani S.A.; Mansoor S.I.U.

Pages 37 - 617 March 2025



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Criminal Justice System in the Age of Artificial Intelligence: Exploring Rights, Risks, and Responsibilities in the Digital Era

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Abstract

AI biases can induce existing imbalances and affect the most affected populations more severely. The study underlines the need to introduce the imperative of transparency and explainability of AI systems. The fact that many algorithmic systems are correspondence opaque raises questions about how such decisions are made and who is accountable when using artificial intelligence, which leads to wrongful arrest or

unfair sentencing. The research calls for effective legislative frameworks that would protect constitutional entitlement due to the widespread use of AI systems. The criminal justice system can effectively embrace AI and avoid the risk of infringing individual rights to make technology serve justice rather than inimical or detrimental to justice and basic human rights.

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DEEP CONVOLUTIONAL MULTI-RELATIONAL GRAPH ATTENTION NETWORK FOR AUTONOMOUS DRONE NAVIGATION IN URBAN WIND ZONES

Sharma R.R.; Pabitha C.; Joshua K.P.; Pradeep S.; Sophia S.; Prabhu D.K.

Pages 784 - 790 2025 International Conference on Multi-Agent Systems for Collaborative Intelligence, ICMSCI 2025 Erode 20 January 2025 through 22 January 2025 Code 207270



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Multi-Agent Systems for Collaborative Intelligence (ICMSCI), International Conference on

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Abstract

Drones are essential for civil engineering operations like logistics and data collecting. Current autonomous drone studies mainly concerns itself with safe path planning in static scenarios; however one of the major challenges of over urban environment is often dynamic factors such as wind, building layouts, and signal coverage that can significantly impact direction stability. For autonomous navigation across dynamic wind zones, this study proposed a new Shape-aware Mesh Dual Lightweight Deep Convolutional Multi-Relational Graph Attention Network with Growth Optimizer (SAMDLCMRGANet-GO)

that leverages local data from RGB cameras and GPS. The method incorporates a Dual Aggregation Transformer for feature extraction, Shape-aware Mesh Normal Filtering for preprocessing, and the LDCMRGAN et for efficient path planning. The proposed approach demonstrates its efficacy in navigating complicated surroundings while retaining high precision in obstacle avoidance and target acquisition, achieving an impressive 99.14% recall, 99.15% accuracy, an outstanding EVA of 0.99, and a low RMSE of 0.41.

© 2025 IEEE.

Author keywords- Dual Aggregation Transformer; Growth Optimizer; Multi-Relational Graph Attention Network; Shape-aware Mesh Normal Filtering

COLLABORATIVE MODEL FOR SUSTAINABLE ENERGY UTILIZATION IN CLOUD INFRASTRUCTURE

Rajagopal M.; **Kumar K.S.**; **Prabagar S.**; Sivasakthivel R.; Ramar G.

Pages 802 - 809 2025 6th International Conference on Mobile Computing and Sustainable Informatics, ICMCSI 2025 Goathgaun 7 January 2025 through 8 January 2025 Code 207131



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Abstract

As the infrastructures of cloud computing provides paramount services to worldwide users, persistent applications are congregated using large scale data centres at the customer sides. For such wide platforms, virtualization technique has been incorporated for multiplexing the essential sources available. Due to the extensive application variations in the workloads, it is significant to handle the resource allocation methodologies of the virtual machines (VM) for assuring the Quality of Service (QoS) of cloud. On concentrating this, the paper proposed a Decentralized Energy-Aware Collaborative Model (DEACM) for effectively managing the data centres in cloud infrastructures. Initially, the optimal model for system

management and power management are declared. Then, functions of workload vectors and data collection about workloads has been carried out for optimal selection of virtual machines to migrate for balancing loads efficiently. This can be further applied for Target-based VM Migration Algorithm for determining the migrating target for VM. Moreover, the algorithm involved in energy utilization with managed QoS. The developed DEACM is evaluated using CloudSim platform and the results are discussed. The results exemplify that the DEACM can balance the workload across variety of machines optimally and provide reduced energy consumption to the complete system efficiently. © 2025 IEEE.

Author keywords- Decentralized Energy-Aware Collaborative Model (DEACM); Destination-based VM Migration Algorithm; Resource Allocation; Virtual Machine Selection

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------|---------------|-----|
| SCOPUS/NA | NA | NA | |



AI/ML APPLICATIONS IN SPOOFING DETECTION IN 5G NETWORKS: CHALLENGES AND SOLUTIONS

Choudhary A.; Singh M.; Hegde R.; Jha M.K.; Rubini P.

2025 3rd International Conference on Intelligent and Innovative Technologies in Computing, Electrical and Electronics, IITCEE 2025 Bengaluru 16 January 2025 through 17 January 2025 Code 207644



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IITCEEE-3 IEEE International Conference on Intelligent and Innovative Technologies in Computing, Electrical and Electronics

Abstract

5G networks has advanced connectivity, high data, low latency and reliability. Along with these features new challenges come with respect to security, particularly spoofing attacks. One of the necessity in 5G and future wireless communication is to prevent the spoofing attacks depending on the applications. Artificial Intelligence (AI) and Machine Learning (ML) present promising solutions for detecting and mitigating spoofing threats in 5G

networks. This paper explains the different types of spoofing and applications, challenges, and future prospects of AI/ML in addressing spoofing in 5G networks. AI/ML algorithms can be used in detection of the location of attackers. This paper also analyses current methodologies, highlight key challenges, and discuss potential advancements that could enhance the security of 5G networks. © 2025 IEEE.

Author keywords- 5G; Artificial Intelligence (AI) and Machine Learning (ML); Security; Spoofing

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------|---------------|-----|
| SCOPUS/NA | NA | NA | |



DEEP LEARNING MODELS FOR ENHANCED RUL PREDICTION IN TURBOFAN JET ENGINES

Judeson Antony Kovilpillai J.; **Mohamed S.S.**; **Pragya**; **Mir M.H.**; **Singh T.**; Singh U.K.

Volume 1073, Pages 685 - 699 2025 4th International Conference on Emerging Trends and Technologies on Intelligent Systems, ETTIS 2024 Noida 27 March 2024 through 28 March 2024 Code 327929



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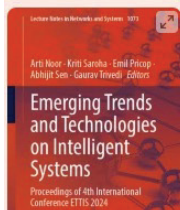
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Emerging Trends and Technologies on Intelligent Systems

Proceedings of 4th International Conference ETTIS 2024

Conference proceedings | © 2025

Abstract

This paper presents an analysis of advanced deep learning techniques for determining the remaining useful life (RUL) of aircraft engine components, with a focus on turbofans and high-pressure compressors. Through this analysis the importance of RUL forecasting to ensure flight safety and efficiency has been emphasized. The study includes papers that use the C-MAPSS Aircraft Engine Simulator Data provided by NASA, which allows realistic simulation of engine damage over different periods of time. Four different datasets were simulated under different operating environments and fault mechanisms, related to engine health with multiple sensors to effectively predict the RUL of turbofan jet engines. Different learning techniques, including convolutional neural networks (CNN),

long short-term memory (LSTM) networks, autoencoders, recurrent neural networks (RNN), gated recurrent units (GRU), together with sparse autoencoders were investigated and their applications in RUL prediction with respect to capabilities and limitations were examined. Furthermore, the paper provides an extensive analysis of these salient deep learning models, using the root mean squared error (RMSE) as an evaluation performance metric. This study provides extensive insights into the effectiveness of these methods in RUL prediction, and facilitates informed decisions for practical applications.

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Author keywords- Autoencoders; Deep learning; LSTM; NASA C-MAPSS Dataset; RMSE; RUL prediction

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



LEVERAGING TRANSFORMER ARCHITECTURES FOR AUTOMATED BUILDING DETECTION IN HIGH-RESOLUTION SATELLITE IMAGES

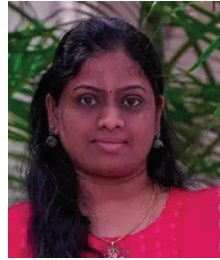
Ezil Sam Leni A.; Revathi T.; Dharmapuri V.; Punugott V.; Gunta B.R.

3rd International Conference on Intelligent and Innovative Technologies in Computing, Electrical and Electronics, IITCEE 2025 Bengaluru 16 January 2025 through 17 January 2025 Code 207644



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Intelligent and Innovative Technologies in Computing, Electrical and Electronics (IITCEE), International Conference

Abstract

Building detection from satellite images is vital in urban planning, disaster management and infrastructure monitoring. Nonetheless, recognising buildings in high-resolution satellite images is an extremely difficult problem computationally speaking and compared to advanced deep learning models. In this work, we employ the Pyramid Vision Transformer (PVT) as the feature extraction backbone and a transformer-based mask prediction model called Mask2Former to precisely segment buildings. The PVT backbone can effectively capture hierarchical multi-scale features of satellite imagery, the Mask2Former refines object queries with cross-attention mechanisms to generate precise mask of buildings. To accommodate the memory and computation overhead of CPU-

based training and inference, we made several optimizations such as reducing batch sizes or configuring based on number of layers. An evaluation of the model was given on INRIA Aerial Image Labeling Dataset, as it is a benchmark for building detection tasks. In our experiments, we demonstrate that STOR is efficient on CPU, and even though it may have certain bottlenecks due to not using parallel processing, the proposed method manages to remain competitive (35s inference time per 512x512 pixels). This study illustrates the potential of using transformer-based networks for building detection in low resource environments, thus maintaining a high accuracy in satellite imagery analysis. © 2025 IEEE.

Author keywords- Building Detection; Mask2Former; Pyramid Vision Transformer (PVT)-Segmentation; Satellite Imagery

Indexing/Quartile

Percentile

Impact Factor

SDG

SCOPUS/NA**NA****NA**

SIMPLE ENGINEERING IN SALINE MONITORING SYSTEM USING IoT

Selvam M.; Naren J.; Vinay Kumar H.S.; Reddy K.M.N.; Teja A.

3rd International Conference on Intelligent Data Communication Technologies and Internet of Things, IDCIoT 2025



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Intelligent Data Communication Technologies and Internet of Things (IDCIoT), International Conference on

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Abstract

An innovative Internet of Things (IoT) solution is designed to improve patient monitoring in healthcare settings. The proposed system presents an Internet of Things (IoT)-based solution to address a critical challenge in healthcare: continuous and reliable monitoring of saline levels for intravenous (IV) therapy. The system employs a network of sensors to measure and track vital data points such as saline bottle weight, patient heart rate, and ambient temperature. These parameters are integrated into a centralized platform using ThingSpeak for real-time analytics and alerts. By automating saline monitoring, the

system mitigates risks such as blood backflow and air embolism while improving patient safety and treatment outcomes.

The core components of this system include the ESP8266 microcontroller, load cell, HW-827 heartbeat sensor, and LM35 temperature sensor, all working in unison to deliver precise and actionable data. This research demonstrates a cost-effective, scalable, and efficient IoT-based solution that ensures timely medical interventions, paving the way for smarter healthcare systems. © 2025 IEEE.

Author keywords- healthcare automation; IoT; real-time data analytics; saline monitoring system

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------|---------------|-----|
| SCOPUS/NA | NA | NA | |



LEVERAGING ML ALGORITHMS TO PREDICT IT JOB OPPORTUNITIES AND INFORM PROGRAMME APPROVAL

Sudharshana N.; Naren J.; **Sumathi D.**

Volume 1221 LNEE, Pages 61 - 70 2025 5th International Conference on Computing and Network Communications, CoCoNet 2023 Bengaluru 18 December 2023 through 20 December 2023 Code 326799



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Lecture Notes
in Electrical
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Book series

Lecture Notes in Electrical Engineering

Abstract

Unemployment is a serious concern around the world. Every year, millions of graduates are without a job. Students enrol in graduate schools without understanding what the job market expects. Upon graduation, the necessary skills to secure employment are often lacking. In such instances, it can be inferred that degree programmes fail to prepare students for job applications and interviews. A framework must be in place to educate graduates about available employment. Hence a job recommender system comes into the picture. Its main objective is to recommend jobs to students based on technical skillset, logical quotient rating, self-learning capability and a variety of other criteria. The system can also serve as feedback for programmes as it gauges the employability of

the student passing out. It can also be used by regulatory councils (government organizations like AICTE which regulate and approve technical programmes) to decide whether the programme should be continued based on the number of job-ready graduates produced. The proposed work has employed classifier algorithms (machine learning), for categorizing student placement data based on features like 'Academic Percentage in Operating Systems', 'Percentage in Computer Networks', 'Hours working per day', etc. The performance of various classifiers is also analyzed.

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Author keywords- AICTE; Classifier algorithms; Job recommender system; Unemployment

FINE- TUNING PRE-TRAINED MODELS FOR ASPECT-BASED SENTIMENT ANALYSIS OF AMAZON FOOD REVIEWS

Sridhar D.; Manikandan K.B.; Padma Priya R.S.; Pradeepa D.; Vasumathi B.; Shankar R.

International Conference on Computer, Electrical and Communication Engineering, ICCECE 2025 Kolkata 7 February 2025 through 8 February 2025 Code 208013



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Abstract

The process of classifying consumer responses to a particular product review as neutral, negative, or positive is known as sentiment analysis. Product owners can utilize sentiment analysis for assistance in them decide whether to continue producing their product, increase production, or eliminate production altogether. As a result, they will gain a deeper comprehension of how customers feel about their products. The method used to determine the opinions expressed in the review regarding a specific feature or aspect of the product is called Aspect Based Sentiment Analysis, or ABSA. Numerous machine learning and natural language processing models are currently available for ABSA. The inability to precisely identify and categories the views expressed towards particular features is a major drawback of the aspect-based sentiment analysis (ABSA) techniques presently in usage for Amazon food assessment tasks. The Hybrid Contextual Aspect-Based Sentiment Analyzer (HCABSA), a hybridized framework for aspect-based sentiment analysis, is developed in this research to accurately assess

the sentiment of Amazon food reviews through a number of processes. This research starts by collecting dataset for Amazon food reviews from Kaggle, preprocessing the data to eliminate noise and irrelevant information, and then using POS tagging to identify the specific aspects and sentiment words related to those aspects, which are nouns and adjectives in the review using the Lexicon based approach. In the following stage, the frequency-based candidate extraction method is utilized to pick the characteristics that are used to determine the product's internal and exterior features. The raw data is then transformed into features that the machine learning models can access using the Bag of Words feature extraction process. The Gradient Boosting Decision Tree technique is then used to categories the sentiment as either positive or negative. Using performance metrics like accuracy, precision, recall, and f1 score, the model's output is compared to existing algorithms and the comparison clearly indicates that the proposed approach provides the maximum accuracy of 98%. © 2025 IEEE.

Author keywords- ABSA; Bag of Words; Frequency Based; GBDT; Lexicon based; Sentiment Analysis

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------|---------------|-----|
| SCOPUS/NA | NA | NA | |



MACHINE LEARNING BASED PHISHING WEBSITE DETECTION SYSTEM - NATURAL LANGUAGE PROCESSING APPROACH

Patni J.C.; Naik S.V.; Harika K.; Bahadure N.B.; Verma K.K.

2nd International Conference on Computational Intelligence, Communication Technology and Networking, CICTN 2025 Ghaziabad 6 February 2025 through 7 February 2025 Code 207865



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Computational Intelligence, Communication Technology and Networking (CICTN), International Conference

Abstract

Natural language processing (NLP) methods can be used to identify phishing websites in addition to static and dynamic features. Phishing sites frequently include certain phrases, misspellings, or misleading text patterns in their material, as well as other visual cues and language that match those of authentic websites. Through the examination of textual components such as anchor texts, meta-descriptions, and homepage titles. The proposed model is able to comprehend the linguistic traits that are frequently seen in phishing websites using NLP-based

features like sentiment analysis, keyword matching, and phrase frequency to increase model's sensitivity. In addition, we use real-time URL parsing to detect possible dangers as users come across them, guaranteeing prompt notifications and lowering the possibility that phishing attempts would be successful. Our study emphasizes how crucial it is to keep improving and upgrading phishing detection models because attackers usually change their strategies. © 2025 IEEE.

Author keywords- Machine Learning; NLP; Phishing website Detection; Random Forest; SVM; Text Classification

Indexing/Quartile

Percentile

Impact Factor

SDG

SCOPUS/NA**NA****NA**

EVALUATING THE EFFICACY OF DEEP LEARNING MODELS IN IDENTIFYING AND MITIGATING CYBERSECURITY THREATS AND ATTACKS

Sheela R.; **Rajagopal S.**; Nagarajan H.; Premsai R.; Aravindan M.; Chakraborty A.

1st International Conference on Advances in Computer Science, Electrical, Electronics, and Communication Technologies, CE2CT 2025 Nainital 21 February 2025 through 22 February 2025 Code 208006



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Advances in Computer Science, Electrical, Electronics, and Communication Technologies (CE2CT), International Conference

Abstract

Due to rapid advancement in digital infrastructure and Internet cyber security threats increased in sophisticated way that necessitate advanced strategies for identification and mitigation. The present study uses deep learning models that act as powerful tool for identifying and mitigating cyber security threats and attacks that leverages the capability for detection of complex patterns using large datasets. The Efficacy of the deep learning model can be evaluated using the study for identification of different types of cyber security threats such as DoS, DDoS, ransomware, password hacking and information

threat. The proposed model identifies and mitigates the threat in less time and it was tested with two different data sets BoT and ToN. The proposed model is measured and evaluated using various performance metrics using cyber security data sets. The study explores the model interpretability and robustness for understanding the potentiality and implications based on cyber security solutions. Study findings shows that the proposed model shows highest accuracy of 99.9% and it is comparatively higher than other existing models in identification and mitigation of threats and attacks. © 2025 IEEE.

Author keywords- Attacks; Cybersecurity Threats; Deep Learning Models; Identification; Mitigation

| Indexing/Quartile | Percentile | Impact Factor | SDG |
|-------------------|------------|---------------|-----|
| SCOPUS/NA | NA | NA | |



ATTITUDE CONTROLLER DESIGN FOR A FLYING WING UAV

Nandanwar P.P.; Parashotambhai A.P.; Verma H.O.; **Hashim S.A.**

2025 1st International Conference on Sustainable Energy Technologies and Computational Intelligence, SETCOM 2025 Gandhinagar 21 February 2025 through 23 February 2025 Code 207866



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Sustainable Energy Technologies and Computational Intelligence (SETCOM), International Conference

Abstract

The simulation study plays a crucial role in making sure that the control strategies for autonomous operations of air vehicles could be developed and implemented in the most safe, efficient, and economical way possible. More specifically, this paper is focused on the modelling and controlbased simulation study for an Unmanned Aerial Vehicle (UAV) named as Zagi flying wing. First-of-all, the short-period dynamics of the UAV is obtained from the rigid body equations of motion and further, it is represented in the state-space and transfer function models. Subsequently, a feedback control system is established for controlling the pitch attitude of the UAV by considering the controller, actuator, UAV dynamics, sensor, etc. in the loop.

Here, the proportional-integral-derivative (PID) based control action is chosen due to its simplicity, reliability, robustness, and easy implementation on the hardware. A separate study is also conducted by considering P, PI, PD, and PID based control actions in controlling the pitch attitude of the UAV.

The comparative analysis of these controllers in the simulation study reveals the appropriate choice for controlling the attitude dynamics of the UAV in the present analysis. It is also evident from this study that the UAV simulation is crucial in enhancing the control methodologies while offering a deeper insight into the UAV's performance. © 2025 IEEE.

Author keywords- PID controller; Pitch attitude; UAV simulation; Zagi flying wing

METAL NANOMATERIALS FOR ELECTROCHEMICAL SENSING

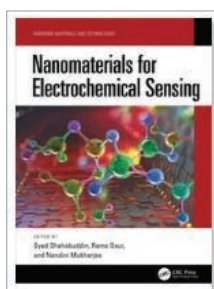
Singh A.; Ojha A.; **Bahadur V.**

Nanomaterials for Electrochemical Sensing Pages 96 - 1091 January 2025



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Chapter

Metal Nanomaterials for Electrochemical Sensing

By *Avinash Singh, Ankita Ojha, Vijay Bahadur*

Book [Nanomaterials for Electrochemical Sensing](#)

Abstract

Metal nanomaterials have drawn much attention from researchers in the past few decades. Their availability in various forms such as pure, mixed, or doped metal oxides makes them a material of high utility in various applications such as catalysis (chemical, electro-, or photocatalysis), electrochemical processes, environmental cleaning, semiconductor appliances, sensing techniques. One such major contribution of these metal nanomaterials is in the field of electrochemical sensing applications. Various metal nanomaterials such as Sn, Ag, Au, Au-Fe, and Pt in different forms and compositions have been used extensively in sensing devices. These metals reduce the cost of operation, are easy to handle and operate, are much faster, and above all show real-time analysis when implied

in electrochemical sensors. These devices have established themselves as clean and recyclable alternatives in the fields of biomedical engineering, environmental engineering, and monitoring of pollution. They have a wide range of sensing applications from environmental pollution monitoring (metal ion detection in water or detection of toxic gases) to medical science (detection of pathogens or biomolecules). This chapter identifies such aspects of electrochemical sensors made up of metal nanomaterials in terms of synthesis, applications, and limitations, along with plausible solutions for them. © 2025 selection and editorial matter, Syed Shahabuddin, Rama Gaur, and Nandini Mukherjee; individual chapters, the contributors.



Intellectual Property Rights (AU IPR Cell)

PATENTS

| | | | |
|------------------|--|------------------------|--|
| Application No | 202541026685 | Title of the invention | AI POWERED CYBERSECURITY SYSTEM |
| Name of Inventor | Dr. Anusha Derangula, Ramakalyani K, Geetha Rani E , Ch Sugunalatha, Boggarapu Guru Sneha, Manavi Sreedhar, and Bhuvaneshwari P | | |



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Abstract

An AI-powered cybersecurity system designed to detect, mitigate, and adapt to cybersecurity threats in real-time. The system comprises a data acquisition module, a threat detection module utilizing machine learning algorithms, an automated response module for immediate mitigation of threats, and a continuous learning engine for dynamic adaptability. This invention

enhances cybersecurity accuracy by reducing false positives, protecting against known and unknown vulnerabilities, and providing seamless integration with existing infrastructures. With its advanced capabilities and compliance with regulatory standards, this system ensures robust protection for digital ecosystems.

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|------------------|--|------------------------|---|
| Application No | 202531035277 | Title of the invention | A SYSTEM AND METHOD FOR ADVANCED BRAIN TUMOR DETECTION USING DEEP LEARNING AND GRAPH NEURAL NETWORKS |
| Name of Inventor | Prof. Debraj Chatterjee, Dr. Sanjay Yadav , Dr. Mohammadi Akheela Khanum, Dr. Shikha Verma, and Dr. Arun Kumar Gautam | | |



Dr. Sanjay Yadav
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Abstract

The present invention relates to an advanced brain tumor detection and classification system utilizing deep learning techniques, specifically Convolutional Neural Networks (CNNs) and Graph Neural Networks (GNNs), to enhance the accuracy of medical image analysis. The system automates the entire diagnostic workflow, including image acquisition, pre-processing, tumor segmentation, feature extraction, and classification, ensuring precise differentiation between malignant and benign tumors. An

explainable AI framework provides visual insights into model predictions, improving interpretability for radiologists. The invention integrates seamlessly with hospital information systems and cloud-based platforms, enabling real-time remote diagnostics and telemedicine applications. By leveraging AI-driven methodologies, this system significantly improves early tumor detection, aiding in timely medical interventions and enhancing overall patient outcomes. Accompanied Drawing [FIGS. 1-2]

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|------------------|---|------------------------|---|
| Application No | 202541028293 | Title of the invention | A MACHINE LEARNING MODEL FOR REAL-TIME PREDICTION OF PATIENT DETERIORATION IN ICUs |
| Name of Inventor | B Mohan Krishna, U Veeresh, K Hema, Dr. Shashank Awasthi, and Dr. Amar Choudhary | | |



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Abstract

The invention relates to a machine learning model for real-time prediction of patient deterioration in intensive care units (ICUs). The model integrates real-time monitoring data, including vital signs, laboratory results, and clinical notes, to generate risk scores for patient deterioration. Utilizing deep learning techniques such as recurrent neural networks (RNNs) and convolutional neural networks (CNNs), the model provides accurate and timely alerts to clinicians. The system seamlessly integrates with electronic health records (EHRs) and ICU monitoring systems, enhancing clinical decision-making and improving patient outcomes.



Dr. Amar Choudhary
Assistant Professor
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|------------------|--|------------------------|---|
| Application No | 202541033650 | Title of the invention | WEARABLE IOT DEVICE WITH AI-DRIVEN REAL-TIME HEALTH MONITORING AND EMERGENCY RESPONSE SYSTEM |
| Name of Inventor | Dr. G. Vetrichelvi, Mr. E.P. Prakash, Dr. D. Manohari, and Dr. Aby K Thomas | | |



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Abstract

This invention discloses a wearable Internet of Things (IoT) device integrated with an artificial intelligence (AI)-based system for real-time health monitoring and emergency response. The device collects multi-modal physiological data—including heart rate, ECG, blood oxygen levels, body temperature, and motion—through embedded biosensors. A proprietary Hierarchical Health Event Detection Method (H-HEDM) processes these inputs using AI techniques such as Long Short-Term Memory (LSTM) neural networks, Random Forest classifiers, and Support Vector Machines (SVM) to detect health anomalies and predict emergencies. Upon identifying critical conditions like arrhythmias, hypoxia, or falls, the system autonomously initiates emergency protocols by alerting preconfigured contacts and transmitting real-time health data and geolocation via cellular or wireless communication. The device operates with a companion mobile application for visualization and configuration. This invention enhances personal health security by enabling proactive intervention, especially in cases where users are incapacitated or unable to respond manually.



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