ALLIANCE UNIVERSITY
CENTRE for RESEARCH
DSIR RECOGNIZED SIRO
DEPARTMENT OF SCIENTIFIC & INDUSTRIAL RESEARCH GOVT. OF INDIA

ALLIANCE RESEARCH CHRONICLES

JULY 2025
Volume 7

ALLIANCE UNIVERSITY
CENTRE for RESEARCH

DSIR RECOGNIZED SIRO

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B/ Scopus (Conference Papers, Book Chapters, Books And Edited Books)

C/ Patents

D/ Design

ABOUT ALLIANCE UNIVERSITY

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

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

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

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

VISION

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

MISSION

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

ABOUT CENTRE *for* RESEARCH

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

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

VISION

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

MISSION

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

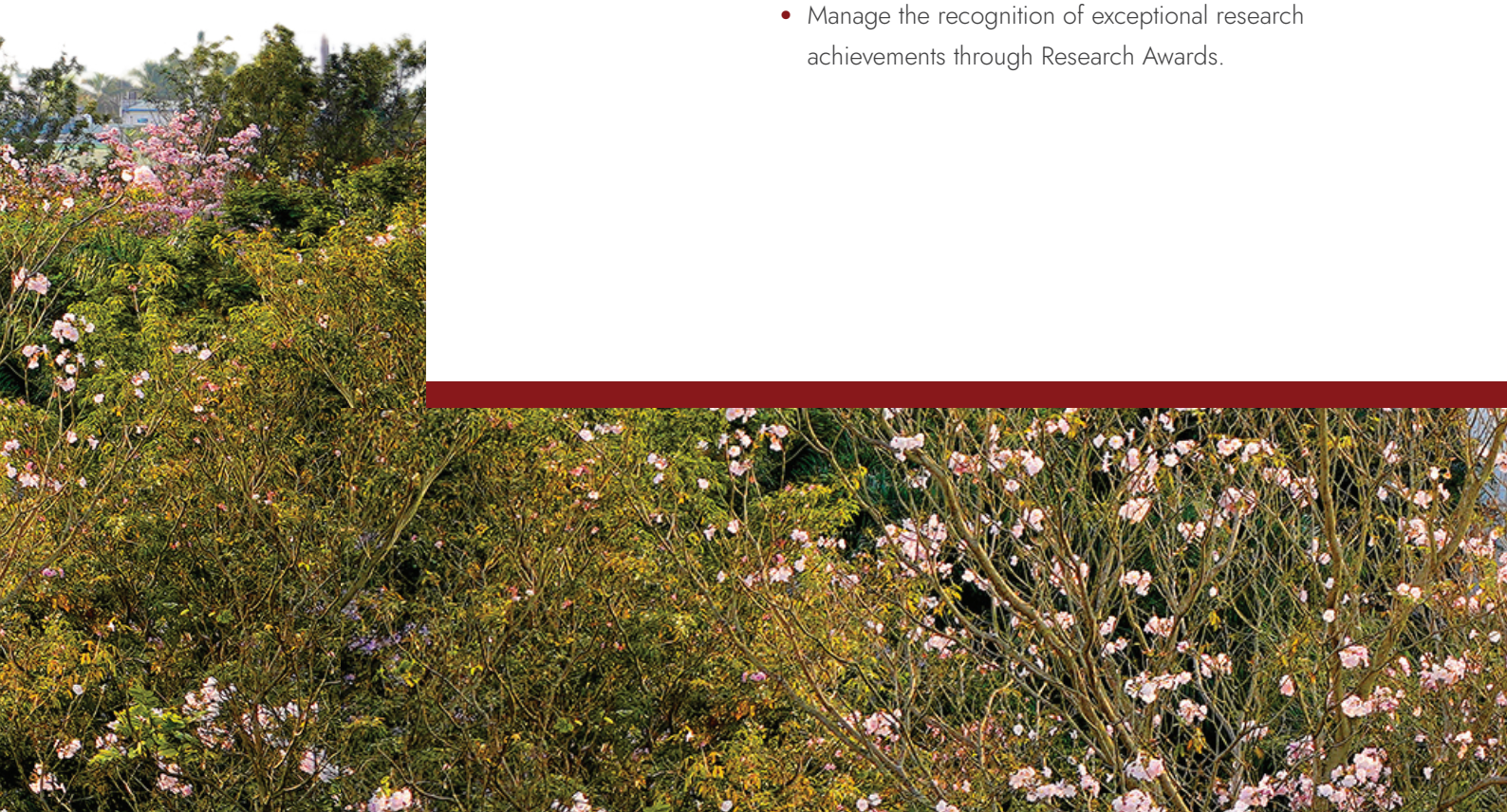
ABOUT CENTRE *for* RESEARCH (Contd.)

CORE VALUES

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

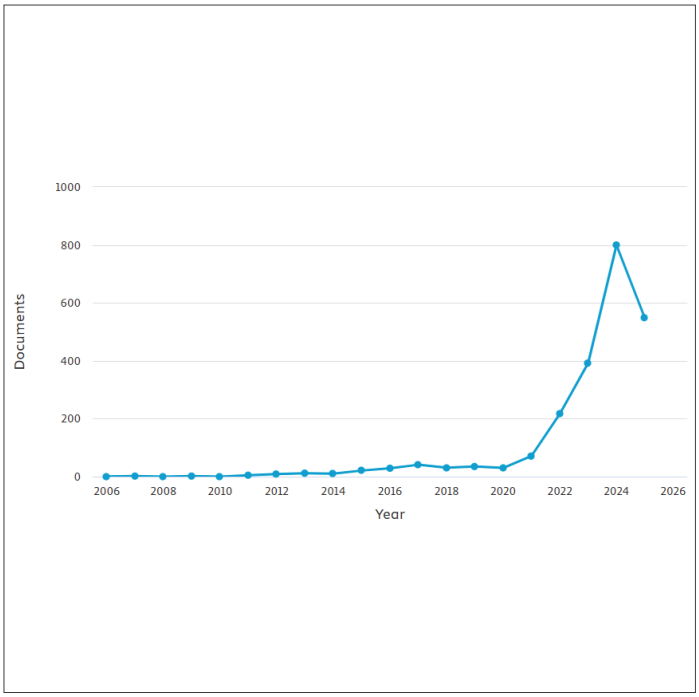
OBJECTIVES

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

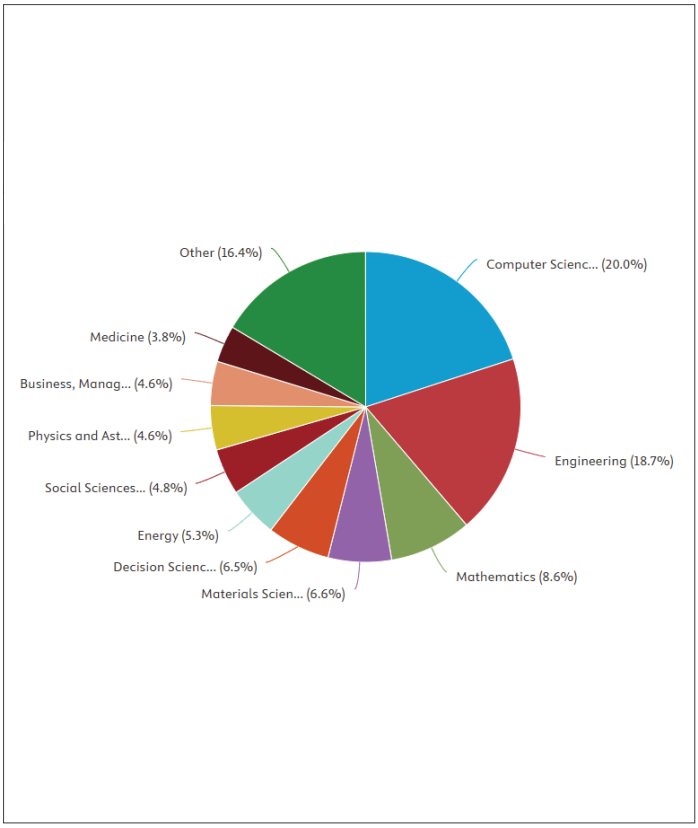


2207	804
Documents	Authors

Documents by Year



Documents by Subject Area

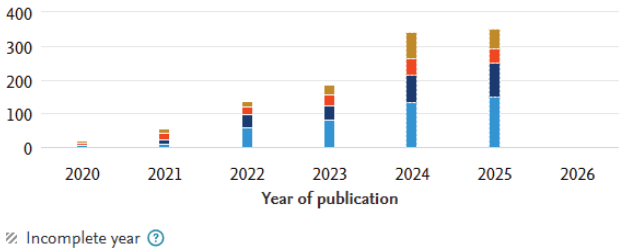


Summary

2207	804	10940	4.3	1.93	45
Scholarly Output	Authors	Citation Count	Citations per Publication	Field-Weighted Citation Impact	H-index

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

Publication by Journal Quartile



Quartiles	Publications	Publication share (%)
Q1 (top 25%)	440	40.2
Q2 (26% - 50%)	277	25.3
Q3 (51% - 75%)	172	15.7
Q4 (76% - 100%)	205	18.7

Cumulative shares	Publications	Publication share (%)
Q1 to Q2 (top 50%)	717	65.5
Q1 to Q3 (top 75%)	889	81.3

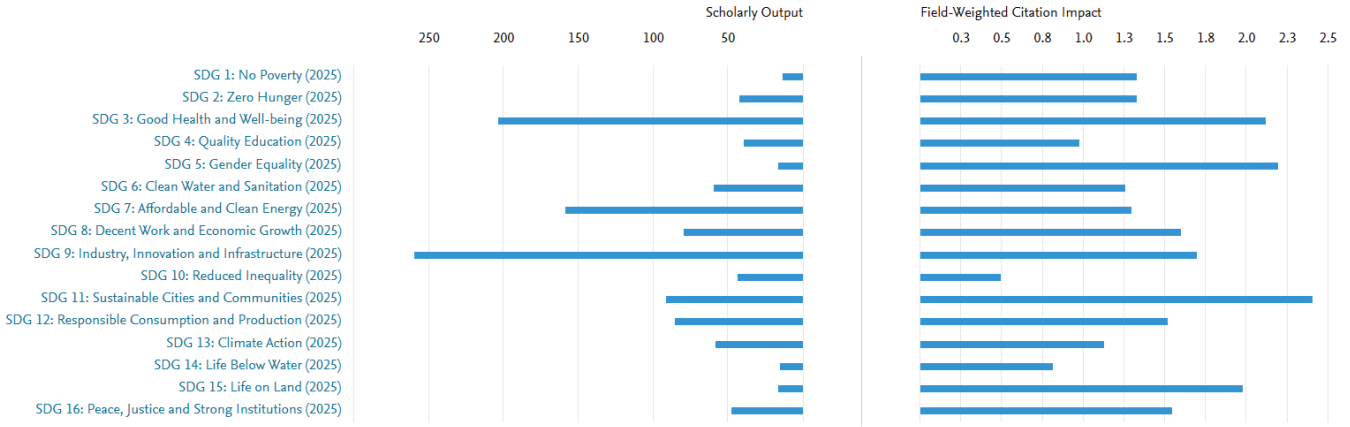
Geographical Collaboration Overall

port

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

Metric	Publication share	Scholarly Output	Citations	Citations per Publication	Field-Weighted Citation Impact
International collaboration	30.9%	630	4,826	7.7	2.09
Only national collaboration	48.7%	992	3,437	3.5	2.28
Only institutional collaboration	14.6%	297	342	1.2	1.02
Single authorship (no collaboration)	5.9%	120	131	1.1	0.44

Publication by SDG



* The Publication metrices and the author affiliations are taken from SCOPUS/SciVal as on Aug 15, 2025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Scopus
JOURNALS


Clarivate™
Web of Science

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	8th	NA	08 DECENT WORK AND ECONOMIC GROWTH

FACTORS BANKS UNDER THE CGTSME SCHEME: AN EMPIRICAL STUDY INTEGRATING THE THEORY OF PLANNED BEHAVIOUR

Trivedi S.; Srivastava A.; **Singh S.P.**

International Review of Management and Marketing Article 2025

Singh, Satyendra Pratap
Alliance School of Business, Alliance University, Bengaluru, Anekal, India

EconJournals
International Review of Management and Marketing

Abstract

This study presented a dataset analysis focused on understanding the factors that had influenced lending patterns in scheduled commercial banks under the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTSME) Scheme. The empirical study integrated the Theory of Planned Behaviour to provide insights into the behavioural determinants that had shaped lending decisions within this specific context. The objective of this research had been to collect and analyze data to identify key factors that had influenced lending patterns and to assess the knowledge and perceived financial risk associated with the CGTSME Scheme. The survey period spanned a specific timeframe, during which data had been collected from a selected sample of banks in these cities. The collected dataset had been employed techniques such as descriptive analysis, correlation analysis, and regression analysis. These analyses had provided valuable insights into the relationships between variables and had shed light on the key factors that had shaped lending patterns in scheduled commercial banks operating under the CGTSME Scheme in the cities of Lucknow, Sitapur, Barabanki, Hardoi, and Kanpur.

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Author keywords- CGTSME Scheme; Lending Patterns; Scheduled Commercial Banks; Theory of Planned Behaviour

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q2	58th	3.13	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

INVESTIGATIONS ON MULTIPLE DAMAGES IN STRUCTURAL BEAMS THROUGH MODIFIED CURVATURE DAMAGE INDEX

Gupta S.K.; Das S.; Soni A.; **Thapa S.**; Katiyar J.K.

Asian Journal of Civil Engineering Article 2025

Thapa, Sheetal
Department of Civil Engineering,
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Bangalore, Bengaluru, India

Abstract

This study uses the curvature damage index method based on artificial neural networks to investigate structural faults. The damages are inspected at multiple locations by using a pinned–pinned supported beam and a tubular propped cantilever beam with a rectangular cross-section. Initially, the experimental and numerical data were utilized to observe the mode shapes of undamaged and damaged beam models. The mode shape data was utilized to investigate the curvature damage index for various damage severities. An artificial neural network (ANN) was utilized for training the experimental data to eradicate undesirable peaks caused by data errors in displacement mode shape data. By using the absolute curvature damage index, the numerically obtained modal parameters (displacement mode shape) are highly suitable for calculating damage areas without ANN training. Further, the mode shape curvature was developed by using central difference approximation for each damage case after obtaining the frequency response (FR) data. To display the damages in beam specimens, a modified curvature damage index (MCDI) is created by using trained data. The study has demonstrated that the proposed technique, which utilises ANN-trained FR data instead of directly using untrained FR data, is capable of identifying structural damages with greater accuracy.
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Author keywords- ANN-trained modal data; Beam models; Frequency response function; Modified curvature damage index (MCDI); Multiple damages

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	69th	5	12 RESPONSIBLE CONSUMPTION AND PRODUCTION

EXTRACTION AND CHARACTERIZATION OF BIOMASS MICROCRYSTALLINE CELLULOSE FROM TERMINALIA CATAPPA LEAVES FOR FOOD PACKAGING APPLICATIONS

Senthamaraikannan P.;Sunesh N.P.; Divakaran D.; Keerthiveettil Ramakrishnan S.; **Suyambulingam I.**; Siengchin S.

Biomass Conversion and Biorefinery

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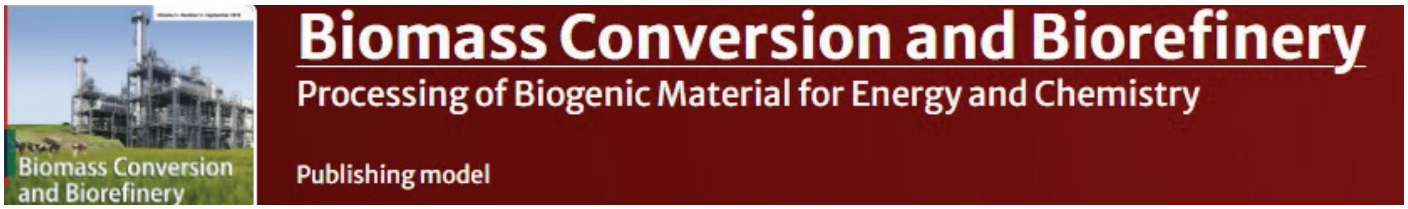
Suyambulingam, Indran
Sophisticated Testing and Instrumentation Centre (STIC), Department of Mechanical Engineering, Alliance School of Applied Engineering, Alliance University, Bengaluru, 562106, India



Abstract

In this research, microcrystalline cellulose was extracted from Terminalia catappa plant leaves (TCLC) through various chemical methods such as neutralization, alkalization, slow pyrolysis, acid hydrolysis, and bleaching. Thermal analysis, scanning electron microscopy, X-ray diffraction analysis, and Fourier transform spectroscopy were employed to get more data pertaining to the isolated cellulose. The crystalline size of the isolated cellulose powder was measured to be 12.69 nm, and it exhibited a notable crystallinity index of 51.09%. Upon scanning with a scanning electron microscope, a smooth and spherical surface is observed. The differential thermogram curve demonstrates that the maximum temperature of degradation occurs at 319.33 °C. The micro-sized particles, with a predominant diameter ranging from 100 to 120 µm, are recognized utilizing ImageJ. The density of extracted cellulose is 1.426 g/cm3. Cellulose-reinforced poly-L-lactic acid biofilms were also prepared. The tensile strength (23.05 MPa) of the 2% TCLC-filled poly-L-lactic acid biofilms was higher than that of films without filler material (20.65 MPa). All the above outcomes conclude that TCLC-filled poly-L-lactic acid biofilms can be used in food packaging applications.
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Author keywords- Biofiller; Biofilm; Biomass; Biomaterial; Cellulose; PLA; Terminalia catappa leaves

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	89th	3.9	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

BLOCKCHAIN ENHANCED DISTRIBUTED DENIAL OF SERVICE DETECTION IN IOT USING DEEP LEARNING AND EVOLUTIONARY COMPUTATION

Prasad V.V.S.H.; Bavirthi S.S.; Anupama C.S.S.; Laxmi Lydia E.; **Kumar K.S.**; Ammar K.; Ishak M.K.

Scientific Reports Article 2025

Kumar, K. Sathesh
Department of Computer Science and Engineering, Alliance College of Engineering and Design, Alliance University - Central Campus, Bengaluru, 562106, India

scientific reports

Abstract

The Internet of Things (IoT) is emerging as a new trend mainly employed in developing numerous vital applications. These applications endure on a federal storage framework primarily concerned with multiple issues. Blockchain technology (BC) is one of the supportive methods for developing IoT-based applications. It is employed to solve the problems encountered in IoT applications. The attack Distributed Denial of Service (DDoS) is one of the leading security attacks in IoT systems. Attackers can effortlessly develop the exposures of IoT gadgets and restrain them as fragments of botnets to commence DDoS threats. The IoT devices are said to be resource-constrained with computing resources and restricted memory. As a developing technology, BC holds the possibility of resolving security problems in IoT. This paper proposes the Metaheuristic-Optimized Blockchain Framework for Attack Detection using a Deep Learning Model (MOBCF-ADDLM) method. The main intention of the MOBCF-ADDLM method is to deliver an effective method for detecting DDoS threats in an IoT environment using advanced techniques. The BC technology is initially applied to mitigate DDoS attacks by presenting decentralized security solutions. Furthermore, data preprocessing utilizes the min-max scaling method to convert input data into a beneficial format. Additionally, feature selection (FS) is performed using the Aquila optimizer (AO) technique to recognize the most relevant features from input data. The attack classification process employs the deep belief network (DBN) technique. Finally, the red panda optimizer (RPO) model modifies the hyper-parameter values of the DBN model optimally and results in higher classification performance. A wide range of experiments with the MOBCF-ADDLM approach is performed under the BoT-IoT Binary and Multiclass datasets. The performance validation of the MOBCF-ADDLM approach portrayed a superior accuracy value of 99.22% over existing models. © The Author(s) 2025.

Author keywords- Blockchain; DDoS attack; Deep learning; IoT; Red panda optimizer

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q2	72nd	7.82	03 GOOD HEALTH AND WELL-BEING

COGNITIVE EMOTION AWARE SYSTEMS USING MULTIMODAL SIGNALS AND REINFORCEMENT LEARNING

Leni E.S.A.; Revathi T.; Radhakrishnan N.

Journal of Machine and Computing Article 2025

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Deaprtment of Computer Science and Engineering, Alliance School of Advanced Computing, Alliance University, Bengaluru, Karnataka, Anekal, India

Revathi T.
Deaprtment of Computer Science and Engineering, Alliance School of Advanced Computing, Alliance University Bengaluru, Karnataka, Anekal, India

Radhakrishnan, Niranchana
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Journal of Machine and Computing

Latest Publications

Abstract

Predicting human behaviour is a complex task. Traditional methods often rely on explicit user input or external observation, which can be restrictive and impractical in real-world scenarios. As an alternative, Brain-Computer Interfaces (BCIs) offer a more direct and specific means of accessing cognitive and emotional states, providing valuable insights into human intentions and decision-making processes. This paper proposes a novel method that predicts and suggests personalised emotion-based activities for individual users based on multi-modal sensory data collected from the brain, body, and environment. Our method overcomes the limitations of conventional systems by incorporating a multi-modal data collection set throughout the day to understand user context and intent better. By analysing this data, we predict the emotions-based practice of the user's day. We train our method using state-of-the-art, nature-inspired reinforcement learning algorithms and agent technology to optimise its optimisations and personalised continuously. The performance evaluation shows that the accuracy and F1 score for the proposed method achieved 95.6% and 84%, respectively, achieving 2 to 3% more accuracy than AI-based emotion state-of-the-art detection methods.

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Author keywords- Agent Technology; Brain-Computer Interfaces; Human Behavior; Multi-Modal Sensory; Personalized Daily Activities

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	94th	6.3	13 CLIMATE ACTION

UNVEILING THE LIGHT ABSORPTION ABILITY OF GADOLINIUM FERRITE-IRON MONOSULPHIDE Z-SCHEME HETEROSTRUCTURE FOR CARBON DIOXIDE AND NITROGEN REDUCTION

Prashanth M.K.; Alhamzani A.G.; Abou-Krisha M.M.; Abdelrahman E.A.; Aljlil S.A.; **Kumar K.Y.**; Shanavaz H.; Parashuram L.; Raghu M.S.; Yadav K.K.

Journal of Alloys and Compounds Article 2025

Kumar, K. Yogesh
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562106, India

Journal of Alloys and Compounds
Supports open access
11.8 CiteScore
6.3 Impact Factor

Abstract

Environmental remediation involves reducing pollution and converting it into value-added products. The current study involves the synthesis of perovskite GdFeO3 (GFO), FeS (FS), and the GFO/FS heterostructure. X-ray diffraction studies (XRD) confirm the formation of orthorhombic GFO and hexagonal FS. Morphological and X-ray photoelectron spectroscopic (XPS) studies indicate the formation of heterostructure. The GFO/FS heterostructure showed lower charge transfer resistance and a 3.5 times superior current response compared to pristine GFO and FS. All the materials were subjected to a light-driven catalytic CO_2 reduction reaction (CRR) and evolved into 47, 65, and 98 μmol h^{-1} g^{-1} of H_2, CH_4, and CO, respectively, in the presence of GFO/FS. Temperature-programmed desorption (TPD) studies using GFO/FS revealed enhanced CO adsorption lies in between 80 and 160 °C. The same trend of increased photocatalytic activity was seen in the nitrogen reduction reaction (NRR) and found to evolve 38 μmol h^{-1} g^{-1} of NH_4^+. The in situ diffuse reflectance Infrared Fourier transform (DRIFT) spectral technique was used to assess the CO_2 and N_2 reduction. The results confirm the formation of CH_4 and CO in CRR and NH_4^+ in NRR, respectively. Based on scavenger studies and optical and Mott-Schottky results, the mechanism of photocatalysis is discussed in detail and shows the formation of a Z-scheme heterostructure between GFO and FS. The magnetization hysteresis (MH) curve of GFO/FS suggests the magnetic property of the material. Enhanced activity in GFO/FS could be attributed to superior N_2 and CO_2 adsorption-desorption isotherm characteristics. Bandgap engineering, a change in edge potential, reduced charge carrier recombination, and the Z-scheme heterostructure all help improve the photocatalytic efficiency of GFO/FS. A good stability of GFO/FS even after 5 cycles makes the fabricated heterostructure a choice of materials in other energy and environmental applications. © 2025 Elsevier B.V.

Author keywords- CO2 reduction; FeS; GdFeO3; N2 reduction; Perovskite; Photocatalysis; Z-scheme

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**76th**	**3.08**	

NETWORK SLICING CONCURRENT RESOURCE ALLOCATION FOR IMPROVING SERVICE RESPONSE OF 6G NETWORK USING A NOVEL CYCLE-CONSISTENT SPATIAL FREQUENCY SELF-ATTENTION NETWORK WITH TASMANIAN DEVIL OPTIMIZATION

Sharanya C.; Lakshmi M.; Velumani P.S.; Perumalla S.; Lakshmanaprakash S.; Jagtap M.; **Choudhary A.**; Ramesh P.
International Journal of Communication Systems

Choudhary, Amar
Dept. of Electronics and Communication Engineering, Alliance College of Engineering and Design, Alliance University, Karnataka, Bengaluru, India

Abstract

In order to enhance resource use and service reliability for 6G users connected via Network-in-a-Box (NIB) architectures, a DL-based slicing-dependent sequential resource distribution technique is presented in the proposed study. The central idea of the method is to create a Cycle-Consistent Spatial Frequency Self-Attention Network (CCSFSAN) and then use the Tasmanian Devil Optimization (TDO) algorithm to fine-tune its hyperparameters. Then, to facilitate accurate network slicing and effective resource allocation, these optimized network instances are utilized by CCSFSAN. The resulting deep learning architecture, to fulfill the needs of 6G-NIB communication networks, provides highly reliable, low-latency, and energy-efficient resource management. The performance evaluating metrics such as capacity, response ratio, latency, energy efficiency, blocking rate, and resource consumption are carefully examined in order to estimate the efficiency of the suggested resource allocation model. The outcomes show how well the proposed model works in the 6G environment to achieve better resource assigning and improved network performance. The developed model offers higher efficiency than the state-of-the-art models by providing a high accuracy of 99.7%, increased capacity of 150 bits/s/Hz, high response ratio of 92%, better resource utilization of 0.94%, less blocking rate of 0.01, and less latency of 40 ms.
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Author keywords- concurrent resource allocation; Cycle-Consistent Spatial Frequency Self-Attention Network (CCSFSAN); deep learning; network slicing; Network-in-a-Box (NIB); slicing-dependent; Tasmanian Devil Optimization (TDO)

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	72nd	5.4	12 RESPONSIBLE CONSUMPTION AND PRODUCTION

BIOGENIC AIDED FABRICATION OF INDIUM SULPHIDE/G-C3N4 TYPE-II HETEROSTRUCTURE FOR SENSITIVE DETECTION AND SUNLIGHT DRIVEN DEGRADATION OF CARBAMAZEPINE

Karigar V.S.; Alhamzani A.G.; Abou-Krisha M.M.; Abdelrahman E.A.; Aljlil S.A.; Shanavaz H.; Prashanth M.K.; **Kumar K.Y.**; Archana S.; Raghu M.S.

Inorganic Chemistry Communications

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562106, India

Inorganic Chemistry Communications
Supports open access
6.7 CiteScore | 5.4 Impact Factor

Abstract

The current work describes the ecofriendly and compatible synthesis of indium sulphide (In_2S_3:InS)-g-C_3N_4 (GCN) heterostructure. Chrysophyceae, commonly known as golden brown algae extract, was used as the reducing agent in a hydrothermal fabrication of InS/GCN. InS, GCN and InS/GCN were used to decorate a glassy carbon electrode (GCE) and evaluate its electrochemical performance using cyclic voltammetry (CV) and amperometric techniques for the detection of the carbamazepine (CBZ) drug. The amperometric method was more sensitive than cyclic voltammetry, detecting concentrations from 0.01 to 240 μM and having a limit of detection of 0.0139 μM. The CBZ recovery studies were conducted for tablets, suspensions, and urine samples, and the recovery percentage was in the range of 97.3 to 99.2 %, with the standard deviation less than 2.6 %. Additionally, CBZ was subjected to light-driven degradation studies in the presence of InS/GCN and found to degrade 81, 93, and 98 % under UV, visible, and sunlight sources, respectively. Various factors affecting degradation, like pH (pH 7), catalyst amount (40 mg) and concentration (10 mg L−1) of drug, were optimized to achieve maximum degradation. Liquid chromatography–mass spectroscopic (LC–MS) results helped predict the degradation pathway. Enhanced activity in InS/GCN could be attributed to the formation of a type II heterostructure with enhanced electron mobility and decreased charge transfer resistance. This new approach serves as a versatile material for use in electrochemistry, the pharmaceutical industry, and environmental remediation. © 2025 Elsevier B.V.

Author keywords- Algae; Carbamazepine; InS/GCN; Photocatalysis; Sensors; Tablets; Type II heterostructure

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q2	**69th**	**5**	12 RESPONSIBLE CONSUMPTION AND PRODUCTION

A SUSTAINABLE BIOMASS-BASED MICROCRYSTALLINE CELLULOSIC BIOFILLER FROM CISSUS QUADRANGULARIS LINN PLANT STEM: BIOMASS TO BIOMATERIAL APPROACH

Divakaran D.; **Suyambulingam I.**; Srisuk R.; Techawinyutham L.; Sunesh N.P.; Rangappa S.M.; Siengchin S.

Biomass Conversion and Biorefinery

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Sophisticated Testing and Instrumentation Centre (STIC), Department of Mechanical Engineering, Alliance School of Applied Engineering, Alliance University, Bengaluru, 562106, India

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

Abstract

The agro-waste materials possess a wide range of prospective applications, especially after the recycling process. In many areas, plants grown without water are rich in cellulosic fibre throughout all parts. In this regard, cellulose was extracted from the plant Cissus quadrangularis Linn stem in this investigation. To optimise the efficiency of cellulose extraction from waste, various chemical methods can be utilised, such as acid hydrolysis, neutralisation, bleaching, and slow pyrolysis. Fourier transform spectroscopy, UV–visible spectroscopy, thermal analysis, scanning electron microscopy (SEM), and X-ray diffraction analysis (XRD) were all employed to gain further insights into the isolated cellulose. The cellulose powder exhibited a crystalline size of 12.30 nm and a crystallite size of 65.08% as measured using XRD analysis. When subjected to SEM, a spherical and abrasive surface was detected. The differential thermogram curve indicates that degradation occurs at a maximum temperature of 377.31 °C. Using ImageJ, the microparticles, with an average diameter of 60–80 µm, were distinguished. AFM was utilised to evaluate the surface roughness and skewness of the particles. The density of the isolated cellulose is 1.513 g/cm3, and the yield percentage was 69.08%. Consequently, enhancing its properties could potentially increase the feasibility of cellulose for future applications.
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Author keywords- Biofiller; Biomass; Biowaste to biomaterial; Cellulose; Cissus quadrangularis Linn stem

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	65th	2.3	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

NUMERICAL AND EXPERIMENTAL STUDY OF LAYERED BEAMS WITH VIBRATION-DAMPING COATINGS FOR IMPROVED VIBRATION MITIGATION

Mishra V.N.; **Gupta A.**; Sarangi S.K.

Mechanics Research Communications

Gupta, Abhay
Department of Mechanical Engineering,
Alliance University, Bangalore, India

Mechanics Research Communications
Supports open access
4.2 CiteScore
2.3 Impact Factor

Abstract

Constrained Layer Damping (CLD) treatments using viscoelastic materials (VEM) are commonly employed to control vibration in automotive and aerospace applications. Special damped laminates and sandwich structures, along with vibration-damping compound sprays, provide effective solutions for mitigating unwanted vibrations and noise. The challenge in composite design lies in minimizing the added weight and material costs while achieving the desired damping performance. In this study, a vibration-damping compound is introduced as a structural solution for vibration reduction. This compound can be easily applied by spraying onto surfaces that further absorb/dissipate vibration and reduce the resonance effects. The proposed composite material comprises a VEM core sandwiched between aluminum face layers, coated with a high-damping compound spray. This innovative design establishes a new standard for low-weight, cost-effective, high-performance sound-damping materials. By replacing traditional materials such as rubbers and foams, the composite significantly reduces weight and cost while maintaining superior damping performance. The dynamic finite element (FE) analysis of the damping treatment arrangement demonstrates an enhancement in damping characteristics. Experimental modal analysis is done to measure the damping performance and natural frequencies for various coating thicknesses. The results show a significant improvement in damping, offering a promising solution for vibration control in structural applications, particularly for industries requiring lightweight, cost-effective materials without compromising performance. © 2025 Elsevier Ltd

Author keywords- Damping; Finite element analysis; Sandwich structure; Vibration analysis; Vibration damping compound; Viscoelastic materials

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

EXTRACTION AND CHARACTERIZATION OF CELLULOSIC FIBER EXTRACTED FROM VITEX NEGUNDO L. STEM

Arunprasath K.; **Senthamaraikannan P.**; Sasidharan I.; Chaudhary V.; Balavairavan B.; **Suyambulingam I.**

International Journal of Biological Macromolecules

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International Journal of Biological Macromolecules
Supports open access
10.3 CiteScore | 8.5 Impact Factor

Abstract

This study investigates the characterization of Vitex negundo L. plant stem fiber (VNF), a novel and sustainable cellulosic material with potential for innovative applications. The plant stems were manually collected and processed using the retting method to obtain the fibers. VNF exhibited a diameter of 553.8 ± 55.05 μm and a density of 828.26 ± 30.43 kg/m3. Chemical compositional analysis revealed the cellulose content to be 65.45 ± 6.26 wt%, hemicellulose at 10.21 ± 3.65 wt%, lignin at 12.16 ± 4.43 wt%, wax content at 0.37 ± 0.06 wt%, and moisture content at 9.65 ± 4.454 wt%. The crystallinity index of 68.65 % indicated the highly crystalline nature of VNF. The stretching frequency of functional groups was studied using Fourier transform infrared spectroscopy, whereas thermal degradation analysis indicated VNF's suitability for high-temperature environments, with peak degradation observed at approximately 200 °C. According to Broido's calculations, the kinetic activation energy was 108.41 kJ/mol. Surface topological analysis identified surface impurities that contribute to improved fiber bonding. The fiber length used for testing was 50 mm, with a tensile strength of approximately 322.9 ± 39.62 MPa. These findings confirmed VNF's excellent mechanical and thermal properties, positioning it as a suitable candidate for lightweight composite applications.
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Author keywords- Chemical analysis; Elemental analysis; Morphological studies; Single fiber tensile strength analysis; Surface topological analysis; Thermal degradation analysis; Vitex negundo L plant stem

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**84th**	**4.6**	07 AFFORDABLE AND CLEAN ENERGY; 09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

TUNABLE $BaCo_xAl_xFe12\text{-}2_xO_{19}$ NANO-HEXAFERRITES: A SMART SOLUTION FOR ULTRA-EFFICIENT MICROWAVE ABSORPTION AND EMI SHIELDING

Jain A.; **Singh C.;** Godara S.K.

Materials Science and Engineering: B

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Materials Science and Engineering: B
Supports open access
7.5 CiteScore | 4.6 Impact Factor

Abstract

This study examines the synthesis, characterization, and assessment of the electromagnetic properties of BaCoxAlxFe12-2xO19 (0.0 ≤ x ≤ 1.0) nano-hexaferrites produced through the sol–gel auto-combustion technique. This approach was selected due to its capacity to generate uniform, nanoscale particles while maintaining controlled stoichiometry and phase purity. The synthesized hexaferrites were subjected to a thorough analysis of their structural, morphological, magnetic, and electromagnetic properties. This was accomplished through the application of X-ray diffraction (XRD), field emission scanning electron microscopy (FE-SEM), energy-dispersive X-ray spectroscopy (EDX), vibrating sample magnetometry (VSM), and vector network analyzer (VNA) techniques. The analysis through XRD validated the emergence of a pure hexagonal M–type phase, noting a reduction in lattice parameters corresponding to an increase in Co-Al substitution. The FE-SEM images demonstrated notable variations in grain size and morphological changes due to doping, shifting from large fused grains to smaller, platelet-like structures. Magnetic investigations revealed a non-linear pattern in saturation magnetization (Ms), which first diminished as Fe3+ was replaced by Co2+ and Al3+, subsequently experiencing a minor rise attributed to decreased porosity and improved exchange interactions. The coercivity (Hc) exhibited a declining trend as Co-Al doping increased, which can be linked to the effects of grain size and a reduction in anisotropy. The study of electromagnetic properties emphasized the significance of permittivity (′), permeability (μ′), and impedance matching in relation to microwave absorption characteristics. The principle of impedance matching and the quarter-wavelength mechanism were essential in enhancing microwave absorption, achieving reflection loss (REL) values of −46.55 dB at 10.05 GHz for W5 (x = 1.0). The examination of eddy current losses, bandwidth-to-thickness ratio, and S-parameters provided additional evidence for the effectiveness of Co-Al-substituted BaM hexaferrites as proficient electromagnetic wave absorbers in radar and EMI shielding applications. This study demonstrates that BaCoxAlxFe12-2xO19 hexaferrites are highly adaptable materials with significant potential for use in microwave absorbers, stealth coatings, and EMI shielding systems. The capacity to adjust their structural, magnetic, and dielectric characteristics via deliberate substitution paves the way for innovative uses in advanced electromagnetic fields.
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Author keywords- Complex permeability and permittivity; Electromagnetic interference (EMI) shielding; Electromagnetic wave absorption; Hexaferrites; Quarter-wavelength mechanism; Reflection loss (REL)

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**89th**	**3.9**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

FAILURE ANALYSIS OF HYBRID FIBER REINFORCED POLYMER COMPOSITE TUBES SUBJECTED TO QUASI-STATIC COMPRESSIVE LOAD: AN EXPERIMENTAL STUDY

Sivalingam S.; Sathishkumar T.P.; **Rajeshkumar L.**; Sathishkumar M.

Scientific Reports Article 2025

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scientific reports

Abstract

This study focuses on the failure analysis of hybrid woven jute and glass fiber-reinforced structural composite tubes with circumferential circular holes under quasi-static testing. Process parameters were optimized to obtain outputs including maximum stress, energy absorption, and specific energy absorption by considering hole diameter, length of the tube, and number of holes drilled as input. Results portray that the crash behaviour of the composite tubes was dependent on the number of holes drilled on the circumference and the analysis of variance results revealed that the interaction between all the process parameters affected the output variables. Energy absorption and specific energy absorption were found to be maximum for the composite tubes of 70 mm length drilled with 4 holes each of diameter 12 mm. Optimal energy absorption of hybrid composite tubes was 87.11 J and the specific energy absorption was 1.527 J/g. A regression model was also developed to predict energy absorption and specific energy absorption. Confirmation experiments portrayed an appreciable correlation between the predicted and experimental values with a less than 5 % margin of error for energy absorption and a less than 2 % margin of error for specific energy absorption. The failure mechanism of the hybrid composite tubes was analyzed using photographs of the composite tubes from which the major failure mechanism was observed to be buckling failure through longitudinal crack propagation. Such short composite columns find their applications in roll-over protection in automobiles, as retrofits in construction applications and developing modular structural designs. © The Author(s) 2025.

Author keywords- ANOVA; Composite tubes; Crash behaviour; Hybrid fiber composites; Regression

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	89th	3.9	03 GOOD HEALTH AND WELL-BEING

COMPUTATIONAL INSIGHTS AND STUDY OF DRUGS FOR DRY EYE DISEASE THROUGH QSPR AND MCDM APPROACHES USING TOPOLOGICAL INDICES

Shanmukha M.C.; Kirana B.; **Usha A.**; K C S.

Scientific Reports Article 2025

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scientific reports

Abstract

Sjögren's syndrome is a cause of dry eye disease (DED) which leads to discomfort due to the lack of tear in the eye. This study aims at computing various topological indices for the molecular graphs of dry eye disease drugs. Multiple linear regression is applied to validate the relation between seven physicochemical properties and 11 topological indices. QSPR analysis is carried out for topological indices having correlation greater than 0.82 with properties polar surface area, polarizability, boiling point, enthalpy, molar refraction, molar volume, molecular weight and complexity. Furthermore, the multiple-criteria-decision-making (MCDM) techniques TOPSIS, and VIKOR are used to rank the drugs. For the considered properties of drugs under the study, polarizability has shown significant results with high correlation and least RMSE (r = 0.996 & RMSE = 1.419). The analysis revealed that Tacrolimus and Cyclosporine being ranked number 1 and number 22 respectively as identified by TOPSIS and VIKOR.

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Author keywords- Degree-based topological indices; Dry eye disease drugs; Multiple linear regression; QSPR analysis; TOPSIS; VIKOR

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

SYNTHESIS AND CHARACTERIZATION OF CELLULOSE FROM PACHYGONE OVATA LEAF BIOMASS AS GREEN REINFORCEMENT FOR BIOCOMPOSITES

Suyambulingam I.; Sunesh N.P.; **Senthamaraikannan P.**; Divakaran D.; Murali A.; Han S.S.; Ayrilmis N.

International Journal of Biological Macromolecules Article 2025

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International Journal of Biological Macromolecules
Supports open access
10.3 CiteScore | 8.5 Impact Factor

Abstract

Pachygone ovata leaves (POL) offer a sustainable option due to their availability as an underutilized agro-waste and their low land, water, and energy requirements. Pachygone ovata leaf cellulose (POLC) was extracted using various chemical extraction methods. The raw material, specifically POL, contained 55.42 % cellulose, whereas hemicellulose and lignin compositions were 12.89 % and 19.90 %, respectively, highlighting its potential for bio-based applications. Following the alkali treatment, the cellulose yield percentage was 56.12 %. The Fourier transform infrared spectra confirmed the presence of primary hydroxyl, carbonyl, and phenolic chemical bonds. The X-ray diffraction analysis yielded a crystallinity index of 48.56 %, indicating that the material exhibited a semi-crystalline state. Thermogravimetric analysis revealed three stages of degradation for the POLC (1.529 g/cm3), with the peak decomposition temperature reaching 288.11 °C. On the basis of the SEM analysis, the POLC showed a fibrillar structure, with micrometric particles averaging 60.40 ± 21.102 µm in diameter. Ultraviolet-visible spectroscopy confirmed the optical properties of the substance by detecting a peak at 292.03 nm. The results revealed that the microcrystalline cellulose produced from the POL showed suitable physicochemical properties, making it ideal for pharmaceutical, biopolymer, and sustainable packaging applications. © 2025 Elsevier B.V.

Author keywords- Biomaterial; Microcrystalline cellulose; Pachygone ovata leaf

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	11th	0.82	04 QUALITY EDUCATION; 09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

PERFORMANCE ANALYSIS OF LARGE LANGUAGE MODELS IN DIALOGUE PROCESSING SYSTEMS FOR LOW-RESOURCE LANGUAGES COMPARED TO ENGLISH LANGUAGE

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Journal of Mechanics of Continua and Mathematical Sciences Article 2025

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JOURNAL OF MECHANICS OF CONTINUA AND MATHEMATICAL SCIENCES

Abstract

This study investigates the performance of dialogue processing systems in low-resource languages, specifically Bengali and Hindi, using advanced transformer-based models. English, a high-resource language, is used as a benchmark for comparison. Transformer models such as BERT, RoBERTa, FLAN-T5, DistilBERT, and GPT-2 are fine-tuned for question answering tasks across these languages. The evaluation includes metrics like F1 Score, Precision, Recall, and Exact Match to assess language-specific performance. The experiment reveals that GPT-2 delivers the highest exact match scores in Bengali and Hindi, while RoBERTa achieves superior F1 scores, indicating balanced performance. The study emphasizes the importance of monitoring training and validation losses to ensure effective model convergence and to identify overfitting. These findings highlight the potential of transformer models in improving dialogue systems for low-resource linguistic contexts.
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Author keywords- Chatbots; Dialog processing system; LLM; Low resource languages; Transformer model

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q3	46th	0.79	16 PEACE, JUSTICE AND STRONG INSTITUTIONS

RECONSTRUCTING THE LEGAL FRAMEWORK OF TRADE SECRET PROTECTION VIS-À-VIS CYBER THEFT: A CROSS-JURISDICTIONAL COMPARATIVE STUDY

Disemadi H.S.; **Chutia U.**; Afdal W.; Taniady V.; Tans D.

Jurisdictie: Jurnal Hukum dan Syariah Article 2025

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JURISDICTIE
Jurnal Hukum dan Syariah
Print ISSN 2086-7549
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Abstract

The growing incidence of cyber theft has exposed critical deficiencies in trade secret protection regimes, particularly in jurisdictions lacking integrated cybersecurity measures. This study analyses the legal frameworks of Indonesia, India, and Australia, using the United States' Defend Trade Secrets Act (DTSA) as a benchmark to evaluate their capacity to address digital trade secret misappropriation. Employing a comparative legal methodology, it examines statutory provisions, judicial interpretations, and enforcement mechanisms relevant to cybersecurity threats. The findings reveal that while Indonesia has enacted a trade secret statute, it lacks procedural safeguards specifically designed to address cyber theft. India and Australia, by contrast, depend on disjointed protections rooted in contract law, breach of confidence, and general cybercrime statutes. None of the jurisdictions provide a robust legal framework incorporating vital cybersecurity components such as ex-parte seizure, digital evidence management, or encryption standards. These shortcomings highlight a critical vulnerability in safeguarding proprietary information amidst escalating cyber threats. The study underscores the urgent need for legislative reform to align trade secret protection with contemporary cybersecurity challenges. Its insights contribute to the ongoing academic and legal discourse on the adequacy of current laws in mitigating cyber-enabled intellectual property violations. © 2025, Maulana Malik Ibrahim State Islamic University of Malang. All rights reserved.

Author keywords- cyber theft; digital misappropriation; legal enforcement; trade secrets

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q1	**80th**	**1.41**	16 PEACE, JUSTICE AND STRONG INSTITUTIONS

OFFENSIVE MODELING TO EXPLOIT ETHICAL HACKING PERSPECTIVE THROUGH IMAGES

Patni J.C.; Saxena S.; Jindal H.

International Journal of Information Technology and Decision Making Article 2025

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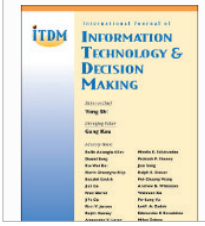

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Supports Open Access

Abstract

Text, audio, video, and image are just a few of the formats in which business data can be transmitted over the Internet. Among them, images are the most widely used medium for transmitting information since they are simple to use and require minimal explanation. In order to carry out ethical hacking, hackers may insert malware that contains geolocation data inside an image. Early detection of a potential attack is insufficient for effective system defense. Therefore, the goal of the study is to look at the potential for malware to be injected through an image and whether the recipient can detect it when the data are transmitted over a wired or wireless network. First, a 5-bit upgraded Least-Significant-Bit (LSB) technique is developed for this objective. Second, an offensive model is created to conceal geolocation data in an image until it reaches the intended computer, for example. The LSB 5-bit mosaic creation method improved the image quality and carefully concealed the sensitive geolocation data in order to trick the security system. The secret key for the embedded code is likewise produced by the mosaic creation approach and is subsequently utilized to recover private geolocation data. The image is well hidden by the LSB 5-bit mosaic technique, which is almost 17.04% better than the conventional LSB 4-bit method. By guaranteeing stealthiness and enabling the concealment of a sizable payload inside the LSBs, the suggested method offers a greater capacity without appreciably deteriorating image quality. The method reduces visual effects, allows concealment inside valid data, and adjusts to different image kinds. It is a flexible tool because of its resistance to compression, ability to function with wired and wireless networks, and difficulty in detection. Additionally, by recognizing the necessity of continuously developing countermeasures against changing threats, the 5-bit method supports ongoing cybersecurity research. Three desktop computers running three different browsers — Firefox, Microsoft Edge, and Google Chrome — that represent both wired and wireless situations are used as a test bed. The machine learning approach is used to identify the precision and accuracy of the devised offensive model. The model on wireless networks shows an average precision of 24.3791, 26.8701, and 40.0158, and average accuracies of 25.69145, 32.19513, and 48.60308, respectively. While on the wired network, it offers a precision of an average of 16.7248, 19.8672, 24.3315, and average accuracies of 14.72685, 17.86944, and 25.42524, respectively. The possible drawback of the proposed approach is that the existing LSB methods for data hiding in images exhibit drawbacks, including limited payload capacity, susceptibility to simple attacks, sensitivity to compression, and potential image quality degradation. These limitations underscore the need for advancements in steganography to enhance security and reliability in concealing information within digital images.
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Author keywords- cybersecurity; geolocation; image-hacking; malicious code; Mosaic

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	54th	1.1	16 PEACE, JUSTICE AND STRONG INSTITUTIONS

EVALUATING THE PROSPECTS OF A UN-BACKED GLOBAL DATA PROTECTION AUTHORITY: A THIRD WORLD PERSPECTIVE

Mone V.; Tilwani R.; Sivakumar C.L.V.; Fayzullaeva S.

International Organizations Law Review Article 2025

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International Organizations Law Review

Editors-in-Chief: Niels M. Blokker and Jacob Katz Cogan

The *International Organizations Law Review* is a peer-reviewed journal that only pu
anonymous review process

Abstract

The exponential intensification in cross-border data flows has augmented privacy and security concerns globally, principally in the Global South. Disparate data regulations betwixt different jurisdictions engender complex compliance challenges for governments and companies embroiled in international data collection, processing and transfers. This research examines the feasibility and imperative of a United Nations (UN) backed framework for omniverse data governance to be referred as undpa—United Nations Data Privacy Authority—one that acts as an overseer and accountability mechanism to monitor data systems universally. Such an agency could facilitate cooperation in adapting data privacy laws to rapid technological vicissitudes, whilst also promoting secure and ethical cross-border data exchange. However, achieving consensus on a global regulatory structure faces impediments, given conflicting priorities and legal regimes across countries. Meanwhile, the paucity of robust data protection laws in manifold Global South nations contrasts with stricter regimes in Europe and North America. The power asymmetry around data governance enables violations of southern digital rights. Absent robust data regulations, the personal information of individuals in developing countries exists in a state of 'virtual terra nullius'—an unclaimed frontier vulnerable to unauthorised extraction and exploitation. This legal ambiguity has catalysed breaches by states and corporate actors, with recent examples targeting databases across the Global South alongside firms like Equifax. Asserting public ownership over citizen data is key to addressing this inequity. Binding legal frameworks must enshrine southern data sovereignty and prevent breaches that violate privacy. Ergo, this research advocates substantive reforms to establish binding global regulatory standards for data protection and governance under the UN. Learning from entities like wipo, cisg such a framework would curb unlawful data weaponisation and violations of digital rights across borders. It would also foster secure and ethical digital ecosystems that protect individual liberties universally—upholding principles of data justice for historically marginalised communities. Constructive North-South cooperation alongside multilateral action is indispensable to realising this vision.
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Author keywords- data privacy; digital economy; international data governance; undpa; United Nations

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/NA	NA	1.4	08 DECENT WORK AND ECONOMIC GROWTH

TECHNOLOGY AS A CATALYST FOR FINANCIAL LITERACY: INSIGHTS FROM THE PRADHAN MANTRI JAN DHAN YOJANA IN BENGALURU'S URBAN POOR COMMUNITIES

Jogish D.; Manjunatha S.; Meti N.G.; Pavan Kumar R.; Udaya S.; **Divya U.**

International Journal of Environmental Sciences Article 2025

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Abstract

A growing number of individuals observe the application of digital financial technologies for advancing financial inclusion as a key method to lower poverty and encourage economic growth that includes everyone. Financial inclusion means making different financial products and services available to people who have not been able to use official financial institutions in the past. These products and services include credit, savings, insurance, pensions, and investment possibilities. A key aspect of this effort is to provide economically disadvantaged groups the capacity to take part in the financial mainstream, which will help reduce poverty. The Reserve Bank of India and the Government of India have started a number of programs to achieve full financial inclusion since they know how important this is. The Pradhan Mantri Jan Dhan Yojana (PMJDY) is one of these policies that has been a game-changer. As of June 12, 2024, the program had signed up almost 52.43 crore account holders across rural and urban India. It was acknowledged by the Guinness Book of Records as the program that helped the most people register bank accounts. Digital banking channels and easy-to-access accounts have greatly increased the availability of formal financial services. However, one important question remains: does financial inclusion alone give people the tools they need to make good financial decisions? Do those who have accounts know enough about money and technology to use these services well? Evidence shows that financial inclusion can't fully achieve its goals without enough financial knowledge. Making bank accounts is important, but it doesn't automatically mean that poor and vulnerable people are actively and well-informed about their finances, especially when it comes to digital financial ecosystems. In this context, this study looks at how the PMJDY and other digital financial technologies can help people in Bengaluru's slums become more financially literate. Using a descriptive study method, primary data was gathered from about 500 people living in slums all throughout the city. The study finds that while financial literacy levels are still low, the PMJDY initiative has helped Urban poorresidents become more aware of and capable with money by linking them to digital financial services. This has laid the groundwork for long-term financial inclusion. © 2025, Academic Science Publications and Distributions. All rights reserved.

Author keywords- Banking; Financial Inclusions; Financial Literacy; Pradhan Mantri Jandhan Yojana; Urban poor community

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**80th**	**3.1**	12 RESPONSIBLE CONSUMPTION AND PRODUCTION

TRIBOLOGICAL PERFORMANCE OF CHEMICALLY MODIFIED D. STOCKSII BAMBOO FIBERS IN COMPOSITE APPLICATIONS

N J.; Sasidharan I.; K B.K.; **Senthamaraikannan P.**; Kumar R.

Journal of Natural Fibers Article 2025

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Abstract

Natural fibers provide an eco-friendly alternative to synthetic reinforcements in composites, with Dendrocalamus stocksii (D. stocksii) fibers emerging as a superior option. However, their high hydrophilicity and reduced crystallinity limit their potential in advanced engineering applications. This study examines the effects of mercerization, benzoylation, and potassium permanganate treatments on the structural, physical, thermal, and mechanical properties of D. stocksii fibers. Among these, benzoyl chloride treatment significantly enhanced hydrophobicity, crystallinity, interfacial bonding, and overall performance. The treated fiber (BDSCF) exhibited a 15.4% increase in cellulose content (84.1%), 50% higher density (1620 kg/m3), 76% greater tensile strength (738.74 MPa), and improved thermal stability (Tmax: 366°C). The resulting friction composite (BDSCC) demonstrated 46% higher compressive strength (34.86 MPa), 87 HRS hardness, 85.1% lower void content, and reduced moisture and water absorption (21% and 50.6%, respectively). Additionally, BDSCC maintained exceptional frictional stability (95–96%) with a coefficient of friction (0.35–0.51) well within industry standards, alongside a significantly lower specific wear rate. Morphological analysis by scanning electron microscopy further validated superior bonding, reduced porosity, and enhanced wear resistance. These advancements position BDSCF and BDSCC as optimal candidates for high-performance, moisture-resistant, and thermally stable composite applications, particularly in tribological environments like brake pads and clutch pads. © 2025 The Author(s). Published with license by Taylor & Francis Group, LLC.

Author keywords- benzoylation; Dendrocalamus stocksii; friction and wear; mechanical characterization; pin on disc; tribology

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	80th	3.1	12 RESPONSIBLE CONSUMPTION AND PRODUCTION

VALORIZATION OF POULTRY WASTE AND AGRO-RESIDUES: IMPACT OF CHICKEN FEATHER AND COCONUT COIR ON BASALT FIBER REINFORCED EPOXY COMPOSITES

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Journal of Natural Fibers Article 2025

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Abstract

This work uses basalt fiber reinforced composites composed of chicken feather fibers and coconut coir. This work uses basalt fiber reinforced composites composed of chicken feather fibers and coconut coir to investigate the value-adding of poultry and agricultural waste. The study examined the effects of different natural fiber contents (5%, 10%, and 15%) on composite performance through mechanical and thermal evaluation. Significant alterations were observed in tensile strength, with 15% coconut coir fiber (CCF) surpassing the baseline composite in strength to 136.76 MPa. Significant increases were seen in flexural characteristics, especially when 15% of chicken feather fiber (CF) reached a strength of 339.25 MPa. With 15% CF, the interlaminar shear strength (ILSS) reached 13.72 MPa, suggesting improved interfacial bonding. At 28.90 kJ/m2, impact strength was maximized with 15% CCF, outperforming the performance of the original composite. Water absorption test demonstrated the hydrophilic character of coconut coir, with a maximum absorption of 17.01% at 60 days, in contrast to the minimal absorption of 9.98% for composites made of chicken feather fiber. The study shows how waste-derived fibers can be used to make ecologically friendly, high-performing composite materials with customized mechanical properties. © 2025 The Author(s). Published with license by Taylor & Francis Group, LLC.

Author keywords- basalt fiber composites; natural fiber reinforcement; sustainable materials; Waste valorization

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	**62nd**	**3.4**	12 RESPONSIBLE CONSUMPTION AND PRODUCTION

CHARACTERIZATION OF FUNCTIONAL BIO-PLASTICIZER FROM MILLETTIA PINNATA LEAF BIOMASS AS A GREEN ALTERNATIVE TO PETROLEUM-BASED PLASTICIZERS

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Macromolecular Research Article 2025

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India

Abstract

With the increasing demand for sustainable and non-toxic alternatives, bio-based plasticizers derived from renewable sources are being developed as environmentally friendly replacements for conventional synthetic plasticizers such as phthalate esters, adipates, trimellitates, benzoates, sebacates, etc. This study investigated the extraction of solid plasticizers from the leaves of the abundantly available Millettia pinnata plant (MPL). It was chemically treated through processes including phytoremediation, slow pyrolysis, alkylation, and filtration to extract the plasticizers. Scanning electron microscopy revealed a porous, smooth surface, while atomic force microscopy further supported the morphological suitability of these materials for biofilm and composite preparation. Fourier transform infrared spectroscopy identified functional groups such as alcohol, amine, amide, hydrocarbon, alkene, and aromatic compounds, while UV analysis confirmed the presence of alcoholic, amino, and carboxyl constituents. The primary phytoconstituents detected in the MPL were molecularly docked to determine binding affinity. Thermal analysis demonstrated that the extracted plasticizer can withstand temperatures up to 267 °C. Furthermore, X-ray Diffraction analysis yielded a high crystallinity index (47.5%) and a low crystalline size (11.3 nm), desirable characteristics in plasticizers. These findings suggest that plasticizers extracted from MPL leaves could serve as a viable, eco-friendly alternative to conventional synthetic plasticizers, offering a sustainable replacement with considerable functional benefits.
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Author keywords- Biofiller; Bioplasticizer; Millettia pinnata leaf

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q3	42nd	1.4	08 DECENT WORK AND ECONOMIC GROWTH

INVESTIGATING THE IMPACT OF INTELLECTUAL CAPITAL THROUGH VAIC MODEL ON THE FINANCIAL PERFORMANCE OF IT FIRMS IN INDIA

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International Journal of Learning and Intellectual Capital Article 2025

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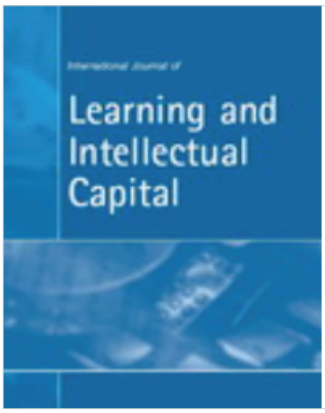

Editor in Chief
Prof. Patricia Ordóñez de Pablos

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1479-4861

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1479-4853

Abstract

This study investigates the impact of intellectual capital (IC) on the financial performance of Indian IT firms. It also investigates the effects of each component of IC (human capital, structural capital, and financial capital) on company financial performance. The study used annual reports from IT companies spanning ten years, from 2013–2014 to 2022–2023. The researchers employed descriptive statistics, correlation, and multiple regression models to determine the influence and relationship between IC and financial performance. This analysis included a total of 221 firms. The findings revealed that the organisations are effectively employing their IC in value development. The empirical results demonstrated that capital employed efficiency improves corporate productivity as evaluated by ATO, whereas ROE and ROA are positively influenced by human capital efficiency. All of the performance indicators are unaffected by structural capital efficiency.
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Author keywords- human capital; IC; intangible assets; intellectual capital; profitability; structural capital; value addition

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**77th**	**4.3**	03 GOOD HEALTH AND WELL-BEING

IN-VITRO BIOACTIVE SILVER NANOPARTICLES SYNTHESIZED FROM HALODULE UNINERVIS PLANT EXTRACT FOR MULTIFUNCTIONAL DRUG DELIVERY

Santhiya Selvam M.; Tresina P.S.; Rajalakshmi R.; Jeeva S.; **Rajeshkumar L.**; Sornalakshmi V.; Mohan V.R.; Sathishkumar M.

ACS Omega Article 2025

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Abstract

The synthesis of AgNPs (silver nanoparticles) was performed using the aqueous extract of seagrass Halodule uninervis (HU) along with silver nitrate. The synthetic production of HU-AgNPs was confirmed by a color change and analyzed with a UV-vis spectrophotometer at 450 nm. The existence of functional groups was verified using Fourier transform infrared (FTIR) spectroscopy. The HU-AgNPs' spherical shape was validated by scanning electron microscopy (SEM) tests. The crystal structure of HU-AgNPs was established by X-ray diffraction (XRD). The roughness and surface morphology were confirmed by atomic force microscopy (AFM). Significant antibacterial action was demonstrated by the HU-AgNPs against Pseudomonas aeruginosa and Escherichia coli, two Gram-negative pathogens. The antioxidant showed the highest inhibition of ABTs (2,2 -azino-bis(3-ethylbenzothiazoline-6-sulfonic acid)) when compared to hydroxyl scavenging, 2,2 -diphenyl-2-picrylhydroxyl (DPPH), hydrogen peroxide (H2O2), nitric oxide (NO), and superoxide tests. By inhibiting -amylase along with -glycosidase, the HU-AgNPs' antidiabetic effectiveness was evaluated. Therefore, to validate the findings and create an antibacterial, anti-inflammatory, antioxidant, and antidiabetic drug, a molecule-level in vivo study is required. Such synthesized nanoparticles have potential applications in multifunctional drug delivery applications.
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Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q3	32nd	NA	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

LOSSY AND LOSSLESS SOURCE CODING INNOVATIONS FOR NEXT-GENERATION MILLIMETER-WAVE AND TERAHERTZ COMMUNICATIONS

Sreenivasu S.V.N.; **Kiran N.C.**; Francis F.; Lalitha R.V.S.; Vekariya D.; Arya S.; Mahesh Kumar A.S.; Philip J.M.

Journal of Environmental Protection and Ecology Article 2025

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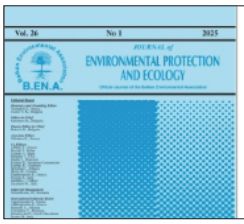

Journal of Environmental Protection and Ecology

International Journal edited by the Balkan Environmental Association (B.E.N.A.) for rapid scientific and other information, covering all aspects of the problems of sustainable development and ecology.

Abstract

In the growing need of large data rates in next-generation communication systems in mmWave and Terahertz (THz) bands, makes it challenging for strike a balance among data compression, data transmission, and computational complexity. The existing source coding methods models fail to handle the diverse data types in dynamic channel conditions in high-frequency communication systems. To addresses this issue, this study presents a hybrid source coding method that integrates the lossy and lossless compression method to optimise the data transmission in mmWave and THz communication systems. An intelligent pre-coding module is integrated with the proposed model for real-time data type and channel condition evaluation process. The adaptive hybrid coding technique is employed for dynamically switching the lossy and lossless compression modes. The sophisticated quantisation and entropy-based techniques is utilised for lossy compression, while improving predictive coding employed for lossless compression and ensuring a high-frequency data transmission in dynamic environments. Additionally, QoS management and intelligent resource allocation are integrated into the system to maximise processing, power, and bandwidth. At last, the intelligent resource allocation and QoS management are employed for optimising the power, bandwidth, and resource utilisation of the system. The experimental results conducted on the CIFAR-10 dataset evaluated the proposed method performance using various metrics including compression ratio, bit error rate, spectral efficiency, latency, and energy efficiency. This method can decrease the energy consumption and resource utilisation in communication systems, which indirectly helps to reduce the environmental footprint of communication infrastructure. Optimising resource usage, the model enables more energy-efficient and sustainable communication technologies in high-frequency environments.

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Author keywords- data transmission; hybrid coding technique; Lossy and Lossless Source Coding; Millimeter-Wave; Terahertz communications

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**89th**	**7.9**	03 GOOD HEALTH AND WELL-BEING; 09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

A REVIEW OF SELF-HEALING AND SELF- ASSEMBLING MONOMERS AND POLYMERS FOR BIOMEDICAL APPLICATIONS INTEGRATED WITH PATENT LANDSCAPE ANALYSIS

Bhuvaneswari V.; Sivalingam S.; Balaji D.; **Rajeshkumar L.**; Sathishkumar M.

Results in Engineering Review 2025

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Results in Engineering
Open access
7.3 CiteScore
7.9 Impact Factor

Abstract

Self-healing is the technique to extend the life of any material and is in key demand around the globe. This article focuses on self-healing and self-assembling monomers and polymers as they are used widely in biomedical applications. Sustainable and efficient solutions across industries are offered by self-assembly in conjunction with techniques such as microencapsulation, reversible photo-cross-linking, and the use of composites. Data mining of patents shows an increasing desire to put these ideas to use in the real world, especially in the fields of nanotechnology, energy, and healthcare. The breadth of these innovations can be increased through ongoing multidisciplinary research, which should lead to discoveries that solve global problems. Advanced materials and their biomedical applications will be driven by the future of these technologies' synergy. The current review analyses various synthesis methods of the self-healing and self-assembling monomers and polymers, their biomedical applications, challenges in implementation and envisage these techniques with the aid of patent landscape analysis for predicting the potential growth of these materials over the existing materials and techniques. This review caters the need of materialists to assess the current state and the future directions of self-healing materials in biomedical applications like tissue engineering, bone regeneration and wound healing.
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Author keywords- Biomedical applications; Patent landscape; Self-assembly materials; Self-healing materials

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	89th	4.1	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

AN OVERVIEW OF THERMOSENSITIVE HYDROGEL BASED NANOCOMPOSITES FOR HIGH TEMPERATURE AND FIRE RESISTANCE APPLICATIONS

Sivalingam S.; Balaji D.; Mahendran R.; Sathishkumar M.; **Rajeshkumar L.**

iScience Review Open Access 2025

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Abstract

The modern world demands sophisticated materials by modifying every aspect of each atom for further acceleration in any specific domain. Fire resistant materials are also the most researched topic of materialists as this open avenue for various fire-related applications. Development of sustainable materials might reduce the harmful environmental effects of the synthetic materials. Thermosensitive hydrogels are specifically used for high temperature and fire-retardant applications. The synthesis of thermosensitive hydrogels from a natural material has been focused on obtaining a sustainable biomaterial. For a better understanding of its thermal behavior, various temperature-related properties were also reviewed. This review focuses on synthesis of thermosensitive hydrogel from natural sources, thermal properties, and future scope through patent landscape analysis. From the review, it was inferred that the thermosensitive hydrogels synthesized from the natural materials cannot only be effectively employed in high temperature and fire retardance but also act as sustainable materials for such applications.
© 2025 The Author(s)

Author keywords- Materials science; Nanomaterials; Thermal property

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	92nd	8.5	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

COMPREHENSIVE REVIEW OF ADVANCES IN NATURAL FIBER COMPOSITES FOR CONDUCTIVE AND EMI SHIELDING APPLICATIONS: MATERIALS, MECHANISMS, AND FUTURE PROSPECTS

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International Journal of Biological Macromolecules Review 2025

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International Journal of Biological Macromolecules
Supports open access
10.3 CiteScore | 8.5 Impact Factor

Abstract

Natural fiber composites (NFCs) have emerged as environmentally friendly and renewable alternatives for lightweight conductive materials and electromagnetic interference (EMI) shielding applications. However, their inherently low electrical conductivity necessitates the incorporation of conductive fillers such as carbon nanotubes, graphene, and metal nanoparticles to enhance their functional properties. In addition to information on environmental durability and recyclability, standardized testing procedures for assessing electrical, mechanical, and shielding performance are provided. Emerging intelligent NFCs with adaptive and self-healing capabilities receive particular focus. Future research directions are suggested, with an emphasis on multifunctionality, green processing, and circular design techniques. These developments position NFCs as sustainable and high-performance candidates for next-generation shielding materials in electronics, aerospace, and telecommunications. However, challenges such as moisture sensitivity, fiber–matrix compatibility, and performance trade-offs remain key obstacles to widespread industrial adoption. However, recent developments in hybrid composite structures, surface modifications, and bio-based conductive fillers are paving the way for commercial applications in wearable electronics, automotive components, aerospace structures, and military defense systems. In this review, recent developments, challenges, and future perspectives of conductive and EMI shielding NFCs are summarized, highlighting their potential to replace traditional synthetic composites in high-performance applications.
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Author keywords- Carbon nanotubes; Conductive composites; Electrical conductivity; EMI shielding; Natural Fiber composites

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	19th	0.46	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

EDIBLE INNOVATIONS: EXPLORING THE IMPACT OF IP COMMERCIALIZATION IN THE FOOD AND BEVERAGE INDUSTRY IN INDIA

Nelson K.C.; Gardner K.D.; **Kishore V.S.**

Multidisciplinary Reviews Review 2025

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Multidisciplinary Reviews (ISSN: 2595-3982)

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Abstract

India's Food and Beverages (F&B) industry, with its unique taste receptors and cultural influences, is thriving. It rapidly expands and adopts advanced manufacturing, operational, and management processes. This paper delves into the transformative role of intellectual property (IP) commercialization. It is a legal process and a key driver of innovation, competitiveness, and growth within India's dynamic F&B sector. Additionally, the paper provides a comprehensive analysis of IP's financial, competitive, and operational benefits, highlighting how IP commercialization facilitates market expansion. The paper also examines the multifaceted landscape of IP commercialization within the food sector, analyzing strategies, challenges, and opportunities businesses face to leverage their IP assets. A key point emphasized is the need for IP protection from the inception of an invention, as any delays can lead to the loss of novelty and potential leakage. By effectively preserving, managing, and utilizing IP assets, the F&B industry can address the challenges of a constantly evolving sector and establish a favorable position for sustained growth, innovation, and success. This paper aims to provide valuable insights for industry stakeholders and promote sustainable growth and innovation in India's food and beverage (F&B) industry, thereby optimizing the impact of intellectual property (IP) commercialization.

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Author keywords- food innovation; intellectual property rights; IP assets; sustainability

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/NA	NA	NA	07 AFFORDABLE AND CLEAN ENERGY; 13 CLIMATE ACTION

NEXT GENERATION BUILDING MATERIALS FOR ENERGY EFFICIENCY AND CLIMATE RESPONSIVE DESIGN

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Discover Applied Sciences Review 2025

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Discover Applied Sciences

Publishing model
Open access

Abstract

The growing demand for sustainable construction, driven by climate change and urban expansion, highlights the urgent need for next generation building materials that enhance energy efficiency while supporting environmental goals. Traditional materials often fall short in addressing dynamic thermal loads, resource efficiency, and occupant comfort. This review investigates recent advancements in energy-efficient and climate responsive building materials, focusing on their insulation properties, thermal regulation, durability, and ecological impact. The objective is to assess the performance, benefits, and limitations of materials such as phase change materials (PCMs), aerogels, vacuum insulation panels, nanocomposites, and bio-based alternatives including straw, cork, and recycled steel. Based on findings from experimental, numerical, and analytical studies, these materials demonstrate significant potential to reduce energy consumption, improve indoor thermal comfort, and contribute to low-carbon construction practices. However, challenges such as high upfront costs, scalability issues, and lack of standardized performance metrics remain. The review recommends prioritizing life-cycle performance assessments, cost-effective production, and integration into building codes to support practical deployment. This work provides actionable insights for architects, engineers, and policymakers aiming to implement energy smart and climate-resilient design strategies through advanced material selection.
© The Author(s) 2025.

Author keywords- Bio-based insulation; Energy-efficient building materials; Phase change materials (PCMs); Sustainable construction; Thermal insulation technologies; UN sustainable development goals (SDG 9)

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q2	74th	3.3	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

OVERVIEW OF PHOTON-COUNTED THREE-DIMENSIONAL IMAGING AND RELATED APPLICATIONS

Dodda V.C.; Kuruguntla L.; Ravichandran N.K.; Lee K.-S.; Sollapur R.; Damodaran M.; Kumar R.; **Anilkumar N.; Itapu S.**; Kumar M.; Matoba O.; Hennelly B.M.; Stern A.; Muniraj I.

Optics Express Review 2025

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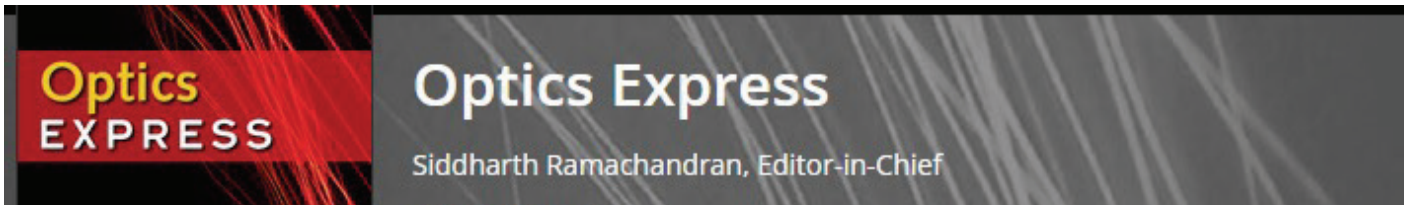

Abstract

Due to its detailed spatial mapping capability, three-dimensional (3D) imaging has became an indispensable tool for numerous scientific applications, including medical diagnostics, industrial inspection, autonomous navigation, environmental monitoring, etc. Conventional 3D imaging techniques often suffer from limitations such as poor resolution,and sensitivity, especially in low-light or photon-starved imaging conditions. A photon-counted imaging (PCI) system is often preferred to overcome this limitation. It is known that PCI systems leverage photon detection techniques to capture high-resolution 3D spatial information with exceptional sensitivity and resolution. To achieve this, single-photon detectors are used to count/detect (typically from single to a few hundred) photons from extremely low light level imaging conditions. This paper provides a comprehensive overview of PCI-based 3D imaging systems aimed at overcoming the limitations of the conventional 3D imaging systems. In addition to this, we also discuss some of the add-on applications of PCI systems, including information security, denoising, and resolution enhancement. This article comprises three major sections with four topics to provide an overview of recent research activities using photon-counted imaging systems.
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Author keywords-

Engineering controlled terms: Avalanche photodiodes; Diagnosis; Image resolution; Imaging systems; Medical imaging; Particle beams; Three dimensional computer graphics

Engineering uncontrolled terms: Autonomous navigation; Imaging conditions; Indispensable tools; Industrial inspections; Mapping capabilities; Medical diagnostics; Scientific applications; Spatial mapping; Three dimensional imaging; Three dimensional imaging systems

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/WOS/Q1	**80th**	**3.1**	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

A REVIEW ON FIBER PROPERTIES, MANUFACTURING, AND CRASHWORTHINESS OF NATURAL FIBER-REINFORCED COMPOSITE STRUCTURES

Shaik M.S.; Sankara Subramanian H.; B R.K.; **Suyambulingam I.; Senthamaraikannan P.**; Kumar R.

Journal of Natural Fibers Review 2025

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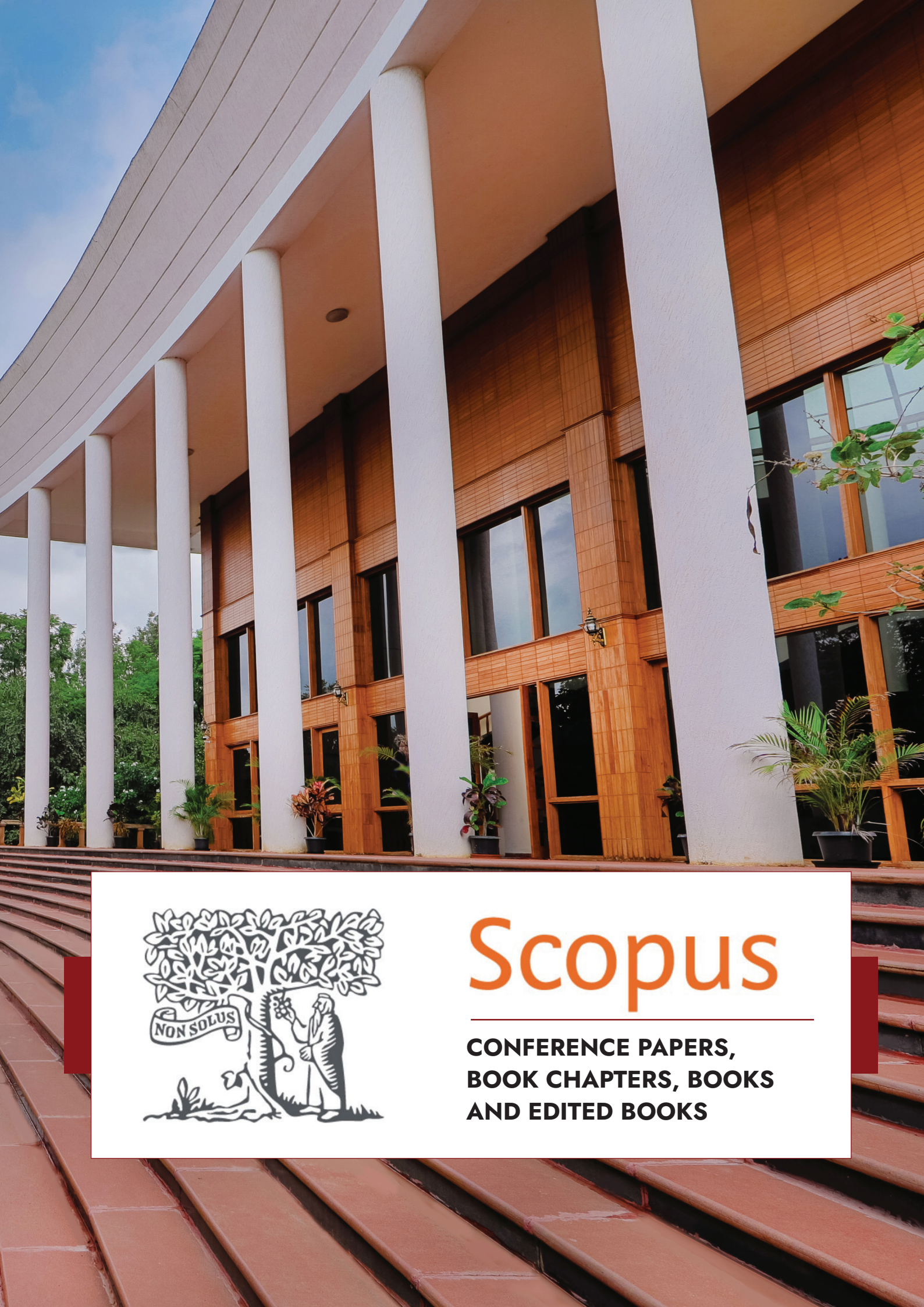
Abstract

Research into natural fibre-reinforced polymer composites (NFRCs) has intensified because society demands sustainable biodegradable substitutes for synthetic composites. This paper investigates plant-based natural fibres from cultivation up until extraction, followed by chemical treatments before manufacturing stages, while analyzing their resulting mechanical and thermal characteristics. This paper specifically investigates NFRCs crashworthiness through examinations of failure modes and energy absorption mechanisms together with investigations of structural geometry and fibre volume fraction and orientation effects. The study explains different manufacturing processes, including hand lay-up and compression molding, as well as vacuum bagging and bladder molding, because their influence on mechanical performance needs assessment. Current research approaches the following issues: weak bond strength between fibre and matrix, and moisture sensitivity, while outlining future perspectives that focus on advanced chemical transformation and bio-resin combination approaches. The comprehensive guide provides instructions for selecting materials along with designing structures for energy-absorbing lightweight solutions and environmentally friendly applications in the transportation and aerospace industries. © 2025 The Author(s). Published with license by Taylor & Francis Group, LLC.

Author keywords- chemical treatments; composite fabrication; crashworthiness; extraction methods; mechanical performance; Natural fibres; sustainable materials



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Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

REVOLUTIONIZING RESEARCH: THE TRANSFORMATIVE ROLE OF CHATGPT IN SCIENTIFIC RESEARCH

Mariappan J.; **Sahdev S.L.**; Krishnan C.; Malik F.A.

The ChatGPT Revolution: How Conversational AI is Transforming Customer Service and Business Operations Book Chapter 2025

Sahdev, Supriya Lamba
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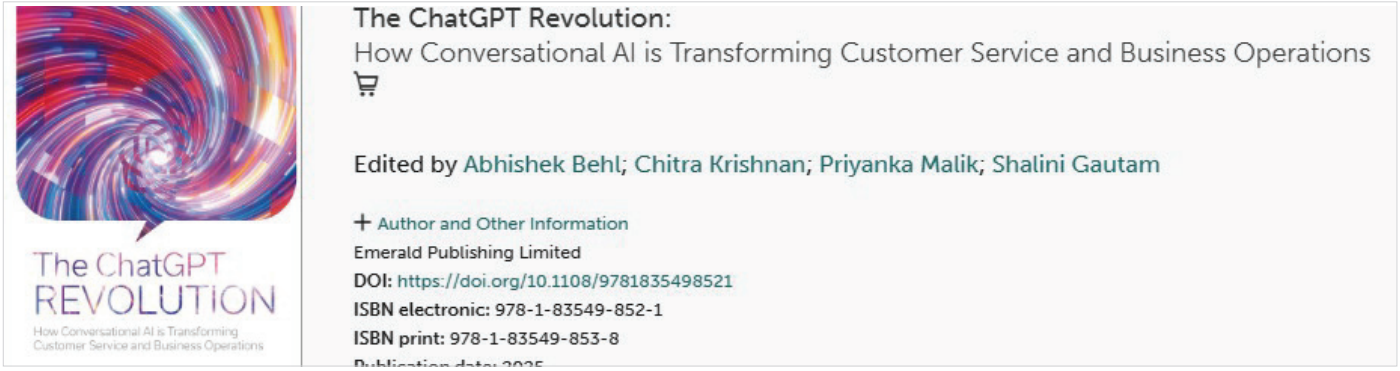

Abstract

This chapter aims to look at how the use of ChatGPT can influence scientific studies and lists possibilities of the tool in the scientific procedure. This paper elucidates on how the conception of ChatGPT makes the process of an agreement, the filtering of information, assistance in data analysis, analysis, and synthesis, aid in coming up with hypotheses, and experiment planning. In addition to the points, this chapter is also devoted to the collaboration and communication in industry and research fields as well as the problems of ethical use of AI. The propositions made in this work, as well as the instances and experiences described, contribute to the arguments that the approaches to the modern problems in different disciplines can be developed using AI tools like ChatGPT for the research approaches. Further prospects of application of AI in research are also analyzed, including its interaction with other fields, increasing personalization, and increasing governance. Thus, this chapter ends with the confirmation of the necessity to find the middle ground between creativity and morality in the process of science.
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Author keywords- artificial intelligence; ChatGPT; Data analysis; Ethical considerations; Hypothesis generation; Innovation; Interdisciplinary collaboration; Literature review; Scientific research

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

HR EVOLUTION FROM TRADITIONAL METHODS TO CUTTING-EDGE HR 5.0

Khan R.K.; **Gowda K.R.**

Harnessing AI to Transform Human Resources in Future Workplace Practices Book Chapter 2025

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Alliance University, India

Harnessing AI to Transform Human Resources in Future Workplace Practices
Muhammad Asif Qureshi (Bahria University, Karachi, Pakistan)
Release Date: June, 2025 | Copyright: © 2025 | Pages: 334
DOI: 10.4018/979-8-3693-8669-9
ISBN13: 9798369386699 | ISBN13 Softcover: 9798369386705 | EISBN13: 9798369386712

Abstract

The field of human resources is evolving dramatically, moving from antiquated practices to cutting-edge HR 5.0 concept. The article transitions from traditional methods of evolution to the incorporation of technology into HR 2.0, HR 3.0, and HR 4.0, marked by digital tools, data-driven decision-making processes, and human resources management systems. The introduction of HR 5.0, by using cutting-edge technologies like blockchain machine learning and Artificial Intelligence, represents an important move towards a personalized and employee centric approach. The chapter highlights the forces that shaped HR's development, such as the demand for more effective operations, enhanced staff engagement, and real-time data-driven decision-making by fostering inclusivity, diversity, and worker well-being to build resilient work environments. The chapter concludes with an in-depth analysis of the history, the initial evolution phases, the evolution post-pandemic, and the Indian scenario, offering insightful advice on how these developments can enhance HR operations and achieve a competitive edge. © 2025, IGI Global Scientific Publishing. All rights reserved.

Author keywords-

Engineering controlled terms

Artificial intelligence; Cutting; Human resource management; Information management; Learning systems

Engineering uncontrolled terms

Block-chain; Cutting edge technology; Cutting edges; Data driven decision; Decision-making process; Digital tools; Human resource is; Human resource management systems; Machine-learning; Real-time data

Engineering main heading

Decision making

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

VOICES OF THE FUTURE: THE EVOLUTION AND IMPACT OF CONVERSATIONAL AI

Sahdev S.L.; Krishnan C.; Khatoon G.; Nair K.

The ChatGPT Revolution: How Conversational AI is Transforming Customer Service and Business Operations Book Chapter 2025

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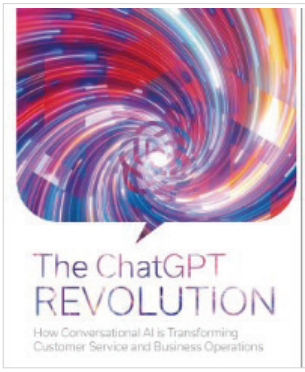

The ChatGPT Revolution:
How Conversational AI is Transforming Customer Service and Business Operations

Edited by Abhishek Behl; Chitra Krishnan; Priyanka Malik; Shalini Gautam

+ Author and Other Information
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Abstract

AI in particular, and more specifically, conversational AI has evoked significant changes in the way people communicate with computing systems over the past few years. This chapter focuses on the history of conversational AI and the shift from basic rule-based conversational systems to NLP and deep learning more profound forms of conversational AI. Hence, using case studies and industry descriptions, this chapter discusses various real-world applications of Conversational AI, such as virtual companions, customer service chatbots, and voice interfaces and devices, and demonstrating their increasing importance in various domains, including healthcare, education, marketing, and finance. Furthermore, this chapter highlights the ability of Conversational AI to improve user experience as well as address the issues of data privacy, ethical AI, and human-AI interaction. Specific focus is placed on the need for multilingual Conversational AI in breaking language barriers especially in international and diverse markets. The directions of development for Conversational AI in future are covered with a focus on further improvements like increasing the individuality and emotions of AI agents and incorporating Conversational AI into augmented reality. In conclusion, this chapter offers a directed view of how Conversational AI is transforming sectors as well as the way consumers and businesses interact with products in an era of advanced digital connection and Artificial Intelligence.
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Author keywords- AI in customer support; Augmented reality; Conversational AI; Emotional AI; Human-AI collaboration; Human-computer interaction; Multilingual AI; Natural language processing (NLP); Virtual assistants; Voice-enabled devices

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

INNOVATIVE STRATEGIES IN LIGHTWEIGHT MATERIALS FOR HIGH-PERFORMANCE DEFENCE APPLICATIONS

Boopathy G.; Srinivasan V.; Ganesan B.; **Kumar M.H.**

Innovative Materials for Next-Generation Defense Applications: Cost, Performance, and Mass Production Book Chapter 2025

Kumar, Mohit Hemanth
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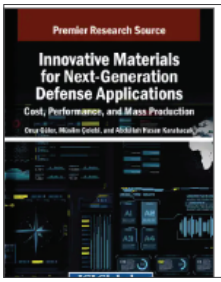

Innovative Materials for Next-Generation Defense Applications: Cost, Performance, and Mass Production

Onur Güler (Karadeniz Technical University, Turkey), Müslim Çelebi (Karadeniz Technical University, Turkey), and Abdullah Hasan Karabacak (Karadeniz Technical University, Turkey)

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Abstract

Defence needs lightweight composites because of their good strength to weight ratio, corrosion resistance, and thermal stability. Then this chapter studies the design and optimization of a number of matrix composites motivated by their mechanical and thermal performance in extreme environments. This highlights the importance of multiscale modelling, simulation and advanced manufacturing in improving composite reliability. This is applied to UVAs, armoured vehicles and naval systems for enhanced mobility and efficiency. Although there have been some impediments to production, the use of AI, nanomaterials, and sustainability will lead to scalable, high-performance solutions. These materials are then substantiated empirically for such critical missions. The chapter coordinates the relationship between the research based in the academia and the requirements by the defence industry, with strategies of new generation of materials having global sustainability goals and the operational needs. © 2025, IGI Global Scientific Publishing.

Author keywords-

Engineering uncontrolled terms

Defence applications; Design and optimization; Innovative strategies; Lightweight composites; Lightweight materials; Matrix composite; Mechanical performance; Performance; Strength to weight ratio; Thermal

Engineering main heading

Corrosion resistance

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	1st	NA	04 QUALITY EDUCATION, 10 REDUCED INEQUALITIES

SHATTERING STEREOTYPES: VR'S EFFECTS ON LEARNING AND SKILL DEVELOPMENT FOR PEOPLE WITH IMPAIRMENTS

Barik Y.; **Ananthanagu U.; Shekhar R.**

EPJ Web of Conferences Conference Paper 2025

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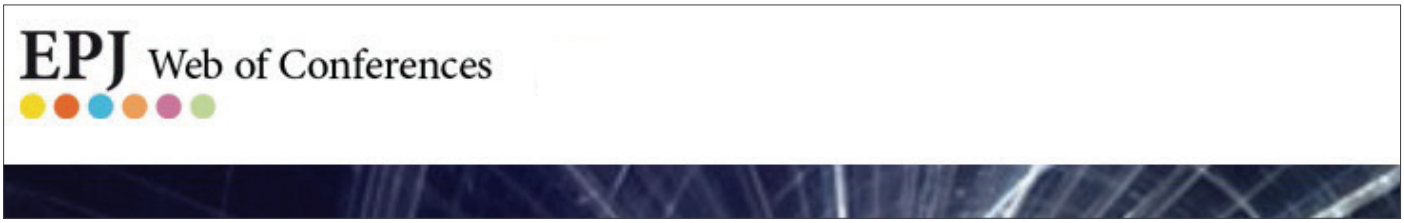

Abstract

Virtual Reality (VR) has surfaced as an important tool in special education, furnishing immersive and interactive knowledge opportunities for scholars with disabilities. Traditional training styles constantly fail to accommodate the different conditions of scholars with cognitive, motor, and sensory impairments, leading to advancement and limited knowledge issues. VR-predicated interventions offer substantiated, multisensory, and real-time interactive knowledge, perfecting pupil provocation, engagement, and retention. This paper presents a regular review of VR operations in special education, assessing their benefits, challenges, and prospects. The findings indicate that VR enhances communication skills, cognitive development, and motor collaboration in scholars with Autism Spectrum Disorder (ASD), dyslexia, cerebral palsy, and visual impairments. Still, challenges analogous to high-performance costs, limited access to VR technology, and lack of educator training continue to hinder widespread handover. The integration of AI-driven adaptive knowledge models with VR presents an innovative result for personalized education. Future disquisitions should concentrate on long-term studies to estimate the effectiveness of VR interventions, the development of cost-effective results, and policy recommendations to ensure equal access to VR technology in education. By addressing these challenges, VR can revise special education, making learning further inclusive, engaging, and effective for scholars with disabilities.
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Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	08 DECENT WORK AND ECONOMIC GROWTH

RISK AND RETURN ANALYSIS OF PROMINENT SECTORAL INDICES OF NSE AND NIFTY 50

Roy S.; **Hameed A.**; Sultana A.S.; **Nair R.R.**

International Conference on Data Science and Business Systems, ICDSBS 2025 Conference Paper 2025

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Nair, Rekha R.
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Abstract

The research studies the risk-return characteristics between specified sectoral NSE indices and the Nifty 50 performance in India. The growth and international attractiveness of India's stock market demand sectoral performance knowledge for sound investment choices, while research on sectoral changes after global disruptions shows limited availability. The research analyzes five primary sectoral indices of Nifty Auto, Nifty Pharma, Nifty FMCG, Nifty Software, and Nifty Energy. Research spanning five years utilizes standard deviation, beta, variance, Sharpe Ratio, Treynor Ratio, and Capital Asset Pricing Model (CAPM) to evaluate performance differences and analyzes historical data collections. The study's results demonstrated that sectoral index measurements diverge substantially from the NIFTY 50 because the null hypothesis was rejected. Various industry performances showed unique behavior patterns because of specific market factors, while the COVID-19 pandemic increased their impact. Specialized investment plans should target specific sectors because different economic situations and outside shocks affect every sector in distinct ways, according to the research data. The research delivers modern insights about performance across financial sectors, which considers recent worldwide disruptions to establish a base for enhancing targeted portfolio management strategies in India's swiftly changing financial sector.

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Author keywords- Sectoral indices; Capital Asset Pricing Model; Nifty 50; return-risk; Sharpe Ratio; Treynor Ratio

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

MACHINE LEARNING MODEL FOR CERVICAL CANCER RISK ASSESSMENT

Patil V.; **Shrivastava V.K.**; Alashetty A.

Lecture Notes in Networks and Systems Conference Paper 2025

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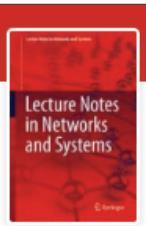

Book series
Lecture Notes in Networks and Systems

Abstract

Cervical cancer is the leading cause of cancer related death among women worldwide and hence screening tools as well as risk prediction markers are very much needed. This study explored the prediction capacity of machine learning algorithms for cervical cancer risk factors with a large dataset. Description provided by the dataset: The data show information on diagnostic features, demographic data, and a clinical history of patients undergoing cervical cancer screening. There are two basic steps involved in data preprocessing, i.e., handling missing values, and standardizing numerical features pair plots and statistical summaries are the two approaches for exploratory data analysis (EDA) which can be used to understand how variables are distributed individually, or their relevance. The four machine learning models—XGBoost, Decision Tree, Random Forest, and Logistic Regression—are trained and assessed using GridSearchCV's hyperparameter optimization. Performance metrics are used to evaluate how well the model predicts the risk of cervical cancer. These metrics include accuracy, precision, recall, and F1-score. Among the best are the Random Forest and XGBoost models, which demonstrate strong classification abilities and emphasize important variables like age, metrics related to sexual behavior, and cytological results. Random Forest achieved 94% accuracy, 60% precision, 54% recall, and 57% F1-score in contrast to XGBoost's 94% accuracy, 53% precision, 63% recall, and 58% F1-score statistics. By integrating these models into an ensemble of voting classifiers, the predictive accuracy and reliability are improved for a variety of patient profiles.
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Author keywords- Decision Tree; Exploratory learning algorithms; Hyperparameter optimization; Logistic Regression; Random Forest; XGBoost

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

A STUDY ON FINANCIAL PERFORMANCE ANALYSIS ON CEMENT INDUSTRIES

Singh N.P.; **Arora K.**; Sultana A.S.; **Babu T.**

International Conference on Data Science and Business Systems, ICDSBS 2025 Conference Paper 2025

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Abstract

Modern infrastructure needs and national economic growth can be achieved through the vital contribution of the cement industries. Global cement industry expansion requires financial evaluation of top-level entities by investors together with policymakers who track these entities. The financial performance of the leading Indian cement companies UltraTech Cement Limited, Ambuja Cement India Ltd. and JK Cement Ltd. receives thorough evaluation during 2021-2023 to establish their liquidity strength and enduring solvency and operational capacity alongside profitability metrics. The information was extracted from balance sheets and the company's annual reports concerning the contemporary economic environment of the cement industry. The analysis shows that Ambuja Cement has the best liquidity and solvency ratios, higher than its competitors, and lower leverage ratios. The long-term solvency of UltraTech Cement reveals an improvement, but short-term liquidity issues are a concern. Financial ratios of JK Cement include a deteriorating liquidity position and a high level of fixed obligations, which points towards a certain amount of financial risk. Gross and net profits remain high for all three companies signifying efficient management of costs. However, a major drawback is the inefficient use of assets and capital plots in reduced return on equity, capital employed, and assets. Operating efficiency ratios are significant enhancements in all firms, especially in inventory management and total asset turnover. The particular assessment shows that, for example, UltraTech needs to pay more attention to its cash management, Ambuja should turn its attention to operational returns, and JK Cement should avoid accumulating higher levels of debt. Some of the recommendations for further research are enlarging the number of tested indicators, including qualitative factors such as a firm's market share and commitment to sustainability; quantifying the effects of economic conditions and government policies; and investigating the correlation between capital intensity and long-term growth of Indian cement companies.
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Author keywords- Financial performance; cash management; cement industry; Operating efficiency ratios; return on equity

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	03 GOOD HEALTH AND WELL-BEING

MACHINE LEARNING PREDICTION OF BLOOD ALCOHOL CONCENTRATION: DRINK AND DRIVE DETECTION

Achary R.; Chourasia R.; Tanuja B.M.; Nikhil; Gowda P.; Kumar M.

Proceedings of 5th International Conference on Pervasive Computing and Social Networking, ICPCSN 2025

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Abstract

The increasing in the number of road accidents produced by drunk and driving has led to substantial loss of life, emphasizing the vital requirement for an effective prevention system. This research presents the design and development of an intelligent alcohol detection and vehicle control system intended at mitigating such dangers and enhancing road safety. The system uses an MQ-3 alcohol sensor to detect the concentration of alcohol in a driver's breath. As the concertation of alcohol, in the breath exceeds a predefined level, the system autonomously halts the vehicle and dispatches an alert containing the vehicle's GPS coordinates via SMS to preconfigured emergency contacts. The system architecture is built around an Arduino Uno microcontroller, which interfaces seamlessly with peripheral components, including GSM, GPS modules, and motor drivers for vehicle control. A performance evaluation process demonstrates high detection accuracy using random forest machine learning algorithm, rapid response times, and efficient power consumption. The results validate the system's efficacy in effectively stopping vehicle operation under the influence of alcohol, offering a viable and practical solution for enhancing road safety.
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Author keywords- Alcohol detection; Arduino; GSM & GPS module; motor control; vehicle safety

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

CLOUD SECURITY USING DEEP LEARNING - ANN APPROACH

Achary R.; Shelke C.J.; Sindhu L.; Parida P.Y.; Singh M.; Raman P.K.

Proceedings of 3rd IEEE International Conference on Knowledge Engineering and Communication Systems, ICKECS 2025

Conference Paper 2025

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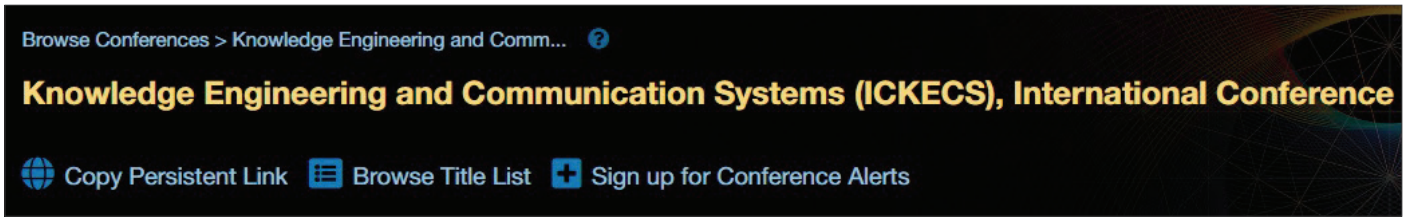

Abstract

As organizations increasingly rely on cloud storage to manage sensitive data, the risk of data exfiltration, the unauthorized extraction of information from the cloud has become a major security challenge. Traditional security systems often struggle to detect these hidden threats. In this paper a novel approach using Artificial Neural Networks (ANNs) is proposed to mitigate these challenges. The system analyzes file transfer activities, network traffic metadata (NTM), and user access patterns (AP), in ANN model to identify anomalies that could signal data storage unlike methods a static, rule-based model, this model continuously learns from new data, increasing its capabilities to detect emerging threats. This dynamic approach provides an efficient and highly flexible solution for real-time cloud security.
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Author keywords- Artificial Neural Network; Cloud Security; Data Exfiltration; Network Traffic Metadata

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

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

ADVANCES IN DEEPFAKE DETECTION: TECHNOLOGIES, METHODS AND FUTURE DIRECTIONS

Tejaswi S.; **Babu T.**; Tejaswi K.

International Conference on Data Science and Business Systems, ICDSBS 2025 Conference Paper 2025

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Abstract

This paper presents a comprehensive survey of deepfake detection technologies, exploring traditional machine learning, deep learning, and preprocessing techniques. The review evaluates the performance of various neural network-based detection models such as MesoNet, Xception, and CapsuleNet while considering classical CNN architectures like DenseNet and ResNet. Additionally, preprocessing methods such as YCbCr color space transformation and edge detection are examined to improve detection accuracy.Even with the fast development of generative adversarial networks (GANs). Existing detection methods suffer such as generalization, dataset limitation and deployment. The focus of this study is the necessity of strong deepfake detection methods and some possible solutions, such as hybrid approaches and increasing diversity of dataset. This survey addresses the critical challenge in the deepfake detection and meanwhile added towards more robust and trustworthy media authentication technique.
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Author keywords- and image manipulation; deepfake detection; Facial recognition; neural networks

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

COMPARATIVE ANALYSIS OF SELECTED OPEN-END MUTUAL FUND SCHEMES IN INDIA

Purohit R.; Thangjam R.; Sultana A.S.; **Babu T.**

International Conference on Data Science and Business Systems, ICDSBS 2025 Conference Paper 2025

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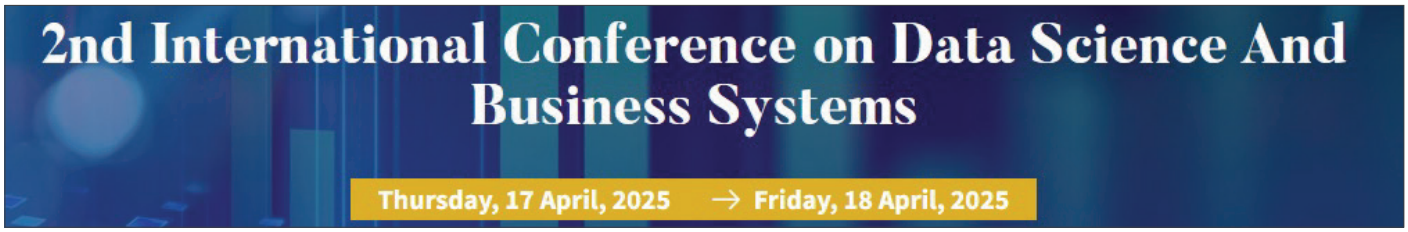

Abstract

Open-ended mutual funds are fast becoming a popular investment decision in India. This research compares several open-end mutual fund schemes in India concerning their performance, risks, and vulnerability to regulatory adjustments. Quantitative methods were used in the study to examine the fund performance basis data from 20 schemes employed over five years across the four major asset management companies. Examples are return, volatility measured by standard deviation, risk measured by beta, and other measures such as the Sharpe ratio and Jensen's alpha. In quantitative aspects, the fund manager and the investment approach are considered. The results show that out of the analyzed funds, a majority had a lower risk-adjusted return than the Nifty index, coupled with different degrees of fluctuation in risk across different categories of funds. The emergence of new guidelines, particularly the recent rules set by the Securities Exchange Board of India, or SEBI, is described in the study about improving transparency and investor protection. It also discusses the increasing importance of sustainable/responsible investments in India. This work is therefore valuable to the knowledge of mutual funds and their operations in India, and the information is useful to investors, managers of mutual funds, and policymakers. Some research implications for future studies are proposed; the main research gap is an examination of how technological developments and changes in investors' characteristics affect the mutual fund business. The author believes that mutual funds will continue to grow at a positive rate in India based on demographic changes, liberalization, and investment improvement.

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Author keywords- liberalization; Nifty index; Open-end mutual funds; risk-adjusted return; volatility

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

A DATA-DRIVEN CROP RECOMMENDATION SYSTEM WITH EXPLAINABLE AI FOR PRECISION AGRICULTURE

Karthik M.; Nandini A.; Vedha P.V.; Latha A.R.; Balaji K.V.; **Sungheetha A.**

Proceedings of 3rd International Conference on Augmented Intelligence and Sustainable Systems, ICAISS 2025

Conference Paper 2025

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Abstract

In this paper, we presented a crop recommendation system for precision agriculture that is based on the machine learning models providing crop recommendations based on the environmental and soil context. Introducing Explainable AI (XAI) in the designed system using LIME, we hope to enhance the level of trust to its recommendations through the understanding of the process which goes into each of them by the farmers. This has been made possible by the system's architecture that consists of backend in Flask and frontend in React. The system was subjected to a rigorous assessment of its reliability and efficiency once developed to obviate measurement errors and ensure its effectiveness and efficiency. Moreover, the feedback on the integration of XAI also reveals an enhancement of interpretability by demonstrating the explanations of such features as pH of the soil, temperature, and moisture of the soil to have a positive effect to the system. Besides improving the chances of accurate crop yields estimation, this approach enables an accurate assessment of farming inputs with regards to sustainability. © 2025 IEEE.

Author keywords- Explainable Artificial Intelligence (XAI); LIME (Local Interpretable Model-Agnostic Explanations)

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	7th	NA	06 CLEAN WATER AND SANITATION

ANALYTICAL SOLUTION OF MULTI-SPECIES POLLUTANT TRANSPORT PROBLEM COUPLED WITH LINEAR REACTIONS AND ADDITIONAL SOURCE/SINK TERM

Chaudhary M.; Mahato H.S.

Springer Proceedings in Mathematics and Statistics Conference Paper 2025

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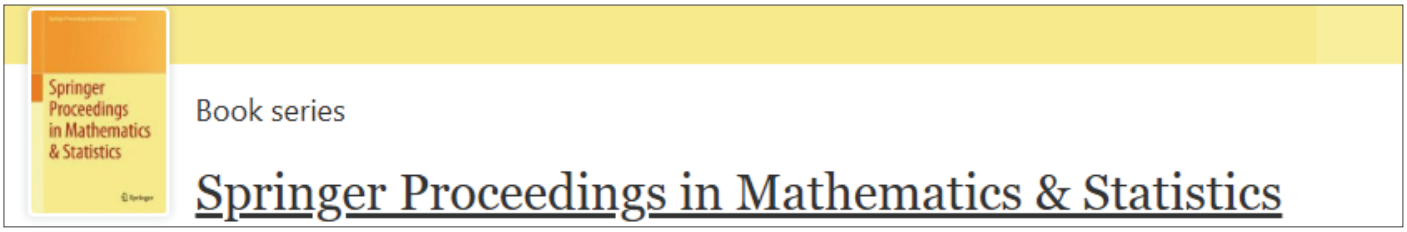

Abstract

This article provides an analytical solution for the multi-species pollutant transport model in the presence of additional source/sink term in one-dimensional semi-infinite medium. The contaminant concentration of reactive species is assumed in liquid and solid phases, both. Model is formulated for constant dispersion coefficient and velocity profile. The effect of average porosity and bulk density of the porous formation is included with the retardation factor and distinct value of retardation factor is considered with each reactive species. Analytical solution is derived for three-species reactive system with first order decay rate by using Laplace transform technique along with different transformation processes and graphs are plotted for concentration variation by using MATLAB software.

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Author keywords- Analytical solution; Pollutant; Reactive species

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

SMART FARMING OF LEAFY HERBS: CONCEPTUALIZING A BLOCK DIAGRAM FOR AUTOMATED CULTIVATION

Radhika K.; **Ramalakshmi K.**; Venkatesan R.

Proceedings of 5th International Conference on Pervasive Computing and Social Networking, ICPCSN 2025 Conference Paper 2025

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Abstract

This paper is aimed to study about the Smart farming of Leafy herbs with the help of IoT technology. To carry out sustainable smart farming at home, IoT enabled sensors and automatic watering system is used. By doing so the whole process gets automated which enables a person to monitor and take necessary action to Cultivate the growth of leafy herb. This helps the people especially the urban people to yield garden fresh Leafy herb at home. This paper consists of the benefits, challenges, results and future prospects of incorporating IoT for smart farming of Leafy green in-home environment.
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Author keywords- IoT; Leafy herbs; Sensors Sustainability; Smart Farming

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	12 RESPONSIBLE CONSUMPTION AND PRODUCTION

COMPARATIVE ANALYSIS OF FINANCIAL PERFORMANCE: TRADITIONAL FINANCE VS. SUSTAINABLE FINANCE COMPANIES IN INDIA

Kumar C.V.S.S.; **Nusrathunnisa;** Sultana A.S.; **Babu T.**

2025 International Conference on Data Science and Business Systems, ICDSBS 2025 Conference Paper 2025

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Abstract

The current research compares the performance of traditional and sustainable finance companies in India. Since sustainability principles are gradually gaining prominence in the context of economic growth and development, especially in new economies such as India, this research proposes to interrogate the possibility of a firm that provides sustainable finance independently generating the financial competitiveness of conventional firms. The research adopts a quantitative comparative research design to compare the financial ratios, risks, and performances of traditional and sustainable automotive firms listed in global stock markets for the last five years. The study shows that those firms operating in the sustainable finance sector offer higher growth rates, better profitability, and optimal asset turnover compared to the other companies. They also use more responsible behaviors concerning debts. Some banks from the traditional finance sector, especially those in the developed nations, have high profitability and efficiency but tend to exhibit more fluctuations in their profitability and more dependency on credit in periods of economic turmoil. These findings have major consequences for investors, policymakers, and heads of the organization. To individual investors, sustainable companies are likely to provide better, longer-term potential investment opportunities. Stakeholders in these sectors should consider these findings to foster fresh development in the insurance industry and to enhance stability in both industries. The present research shows that sustainable practice can be incorporated into a financial plan to improve the profitability, and the company's longevity and thus make the Indian financial industry stronger and more sustainable. © 2025 IEEE.

Author keywords- optimal asset turnover; profitability; sustainability; Traditional and sustainable finance

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

PROFITABILITY PATTERNS IN INDIA'S PRIVATE INSURANCE SECTOR: A COMPREHENSIVE ANALYSIS

Jain L.; **Aparna Pavani S.**; Sultana A.S.; **Nair R.R.**

2025 International Conference on Data Science and Business Systems, ICDSBS 2025 Conference Paper 2025

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Abstract

This research seeks to analyze the profitability pattern of private-sector insurance companies in India. The market has recently opened up to operation and has been growing since the liberalization measures in 1991. Based on a blend of survey and analytic methods, the study assesses many factors regarding profitability in the sector. Surveys were developed in this research to collect primary data, while secondary data were obtained from company financial statements, industry reports, and peer-reviewed publications. Overreaching conclusions encompass implications from the relationship between regulation, technology, consumer orientation, and macro-factors for firms' economic performance. Thus, the study found that technological adoption, mainly concerning tools such as artificial intelligence and data analytics, is vital in improving operating efficiency and profitability. Further, sound risk management practices and efficient management, customer acquisition, and retention are believed to provide a strong foundation for long-term financial performance. However, it also outlines some common issues with the industry, such as regulatory challenges and the high levels of competition necessary for investments. The comparisons between private and public sector insurers serve as useful benchmarks and reveal the potential for development. Although there are restrictions with data quality and availability and the sector being analyzed, this study has strong research value, adding nice knowledge in insurance economics, especially focusing on the Indian insurance sector, which helps industry practitioners, regulators, and policymakers. The research implication is the balanced development of technological directions, customer orientation, moderate risk-taking, and strategic flexibility regarding the changing regulation of insurance to achieve sustainable profits in India's private insurance industries. © 2025 IEEE.

Author keywords- economic performance; insurance companies; private sector; sustainable profits

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q4	14th	0.36	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

ASSESSING THE PERFORMANCE OF CHLORIDE ION INGRESS IN CONCRETE INFUSED WITH COPPER SLAG

Asha K.; Tejaswini M.L.

Lecture Notes in Civil Engineering Conference Paper 2025

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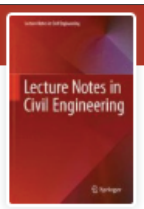

Book series

Lecture Notes in Civil Engineering

Abstract

Significant issues arise when the chloride ions are on higher side in concrete mixture. These chloride ions break down the submissive layer due to their electrochemical nature. This protects the reinforcing bars without varying the pH. Hydrochloric acid is produced, which is a chemical process when these chloride ions come in contact with steel and the surrounding passive materials. This acid corrodes the steel reinforcement, leading to concrete cracking, spalling, and eventual failure. Therefore, chloride-induced corrosion is a major issue affecting the durability of reinforced concrete (RC) structures. This study investigates the ingress of chloride ions in copper slag concrete. Corrosion tests were conducted using thermo-mechanical treatment (TMT) steel. A study on the Rapid Chloride Ion Penetration Test, conducted according to ASTM C1202, found that the values for all grades of concrete, both with and without incorporated copper slag, fell into the "very low" category. An important observation was that the addition of slag significantly reduces the pores in the concrete, making it impermeable. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2025.

Author keywords- Chloride penetration; Concrete; Copper slag; Durability

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	06 CLEAN WATER AND SANITATION

WASTE OBJECT DETECTION USING MINI SUBMARINE IN WATER BODIES USING ADAPTIVE MULTI-MODAL FUSION TRANSFORMER

Sasi Kala Rani K.; Arpitha; Akshay K.M.; **Rajesh Sharma R.**; Bhumar S.S.; Guru Ramdas T.P.; Adhav A.; **Sungheetha A.**

International Conference on Data Science and Business Systems, ICDSBS 2025 Conference Paper 2025

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Abstract

In the modern era, water pollution poses a serious threat to marine ecosystems, leading to damage to aquatic life and in turn, a disastrous impact on long-term environmental threat. The system proposes advanced computer vision techniques to detect and classify the waste trash in the underwater environment. Methods like You Only Look Once (YOLO) and AUVs(Autonomous Underwater Vehicles) have practical limitations that reduce their effectiveness in underwater settings. To overcome the challenges and constraints, a novel algorithm Adaptive Multi-Modal Fusion Transformer (AMFT) is proposed for waste detection in an enhanced way. The proposed work compares the contemporary object detection framework, YOLO model, and AMFT. The system uses datasets with images of underwater with trash including plastic wastes, aluminum wastes and other debris for training and testing. The advantage of the proposed work is cost effectiveness and scalability. Waste hotspots can be identified and cleanup operations can be performed with high priority. The experimental results infer that AMFT based detection system performs extraordinarily well by achieving accurate waste recognition in different underwater conditions, like varying light levels and turbidity. The combination of advanced computer Vision techniques and real-time detection capabilities, the system offers a sustainable and scalable solution for identifying underwater waste, for cleaner water bodies and a more sustainable future. The experimental results showed that the accuracy of the clear water system exceeded 94%, while in dirty water conditions, accuracy decreased slightly but remained above 82%. © 2025 IEEE.

Author keywords- Adaptive Multi-Modal Fusion Transformer (AMFT) Deep Learning; Aquatic Waste; Environmental Sustainability; Image Processing; Object Detection; Real-time Monitoring; You Only Look Once (YOLO)

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

ADAPTIVE QUASI BANG-BANG CONTROLLER FOR STRUCTURAL HEALTH MONITORING

Kumar G.

Proceedings of IEEE International Conference on Signal Processing,Computing and Control Conference Paper 2025

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Abstract

This research aims to optimize the control algorithm for structural vibration reduction while maintaining design simplicity and achieving performance comparable to the clipped optimal LQR/LQG. The quasi-bang-bang controller has been enhanced using particle swarm optimization (PSO) to fine-tune its output weights. In the event of seismic activity, PSO dynamically adjusts these constant output weights to ensure optimal performance under varying load conditions.To evaluate the effectiveness of the optimized controller, a three-story prototype structure equipped with an MR damper is tested. The setup is subjected to a series of recorded earthquake time histories from different environments to assess the adaptability of the controller. The results are then compared with established benchmarks, including the clipped optimal linear quadratic Gaussian (LQG) controller, the quasi-bang-bang controller, and the modified quasi-bang-bang controller. The results show that the PSO-optimized quasi-bang-bang controller outperforms these alternatives, not only by reducing the structural response more effectively but also by consuming less power during operation.
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Author keywords- Controller; Particle Swarm Optimization; Seismic Signal; Structural Health Monitoring; Vibration

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/Q3	38th	0.58	09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

COMPREHENSIVE REVIEW OF END-TO-END DEPENDENCY PARSING WITH AUTO-REGRESSIVE LARGE LANGUAGE MODELS

Ali N.A.; **Ramalakshmi K.**

Communications in Computer and Information Science Conference Paper 2025

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Book series

Communications in Computer and Information Science

Abstract

This paper comprehensively reviews the application of large language models (LLMs) for dependency parsing, focusing on auto-regressive models such as LLaMA (Large Language Model Meta AI). Dependency parsing is a crucial task in natural language processing (NLP), essential for understanding the syntactic structure of sentences. This review traces the evolution of dependency parsing techniques and highlights the significant advancements brought by LLMs. We provide an in-depth analysis of LLaMA's performance, efficiency, and multilingual capabilities, comparing it with other state-of-the-art models like GPT-3 and BERT. Our findings reveal that LLaMA achieves state-of-the-art results with fewer computational resources, excels in multilingual contexts, and demonstrates robustness in parsing raw sentences. We also discuss the ethical considerations, challenges, and future directions in the field, providing valuable insights for researchers and practitioners. © The Author(s), under exclusive license to Springer Nature Switzerland AG 2025.

Author keywords- Large Language Model Meta; Large Language Models; Natural Language Processing

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

DEVELOPMENT OF AN INTEGRATED SAFETY MONITORING SYSTEM FOR COAL MINERS USING SMART HELMETS

Aireddy H.; Greeshya B.B.; Himani M.; Hemanth V.; Papishetty N.; Sheshadri K.; Shravani N.

Proceedings of 3rd IEEE International Conference on Knowledge Engineering and Communication Systems, ICKECS 2025 Conference Paper 2025

Aireddy, Harinath
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Browse Conferences > Knowledge Engineering and Comm...

Knowledge Engineering and Communication Systems (ICKECS), International Conference on

Abstract

The Smart Helmet for Coal Mining through IoT Monitoring project is to improve safety and efficiency in coal mining operations by integrating IoT technology into conventional mining helmets. Coal mining is a dangerous occupation that often takes place in challenging environments, making it crucial to monitor worker safety and environmental conditions. The realization of the smart helmet project, featuring an array of sensors such as DHT11 and MQ135 and IoT functionalities, has ushered in a new era of workplace safety. This innovative device continuously monitors vital parameters like temperature, humidity, and gas levels in real-time inside the coal mine, safeguarding the health and security of workers across various industries. The data collected by these sensors will be wirelessly transmitted to a central monitoring system (CMS) using IoT protocols. The CMS also acts as a centralized dashboard for supervisors and safety personnel to oversee environmental conditions about potential hazards. The platform displays the real time readings of the temperature, humidity, and gas level in the mine environment also with visualization tools like graph for easy analysis and interpretation. © 2025 IEEE.

Author keywords- Central Monitoring System; Coal Mining Safety; IoT Monitoring; Real-time Data; Sensor Integration; Smart Helmet

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

A STUDY ON EQUITY MARKETS - BULLS AND BEARS OF INDIA

Dhruthi P.A.; **Aparna Pavani S.**; Sultana A.S.; **Nair R.R.**

International Conference on Data Science and Business Systems, ICDSBS 2025 Conference Paper 2025

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Abstract

Indian equity has been one of the most vibrant and continuously changing financial markets and has witnessed bull and bear phases in the last two decades. This paper aims to focus on the following objectives: identifying and exploring the complex dynamics that underpin these cycles and their consequences for market participants, Indian policymakers, and the economy more generally. Using quantitative and qualitative methodologies, this research examines bull and bear spans within the Indian equity market across the 2003 to 2022 period. The research data is collected through a secondary research approach that incorporates historical and numerical data analysis, and through experts' opinions that give a quantitative and qualitative data trend view on the market, The methodologies include time-series analysis, correlation analysis, and event analysis to determine the market phase and its causes. Here are some main conclusions where quite clearly it is shown that the Indian stock market possesses a high degree of stability and development opportunities, even though it experiences negative impacts from the world crisis getting back on its feet to reach a new nominee. Moreover, the strong relationship between macroeconomic variables and market returns is confirmed, supporting good economic management. The study points to the growing globalization of Indian markets, the changing pattern of market entry, and the emerging role of individual investors. The findings indicate that establishing strong and effective rules and regulations, and a market environment for managing cycles is essential. Although various cycles remain discernible, it should be noted that the general tendency in the Indian equity market has been considered to be rather upward, and the Indian market has been gradually maturing. The paper reiterates the market's significance in India's economic goals before outlining research directions for future work, such as technological development on the market or sustainability in investing. © 2025 IEEE.

Author keywords- bull and bear; Financial markets; market returns; sustainability in investing

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

DEVELOPMENT OF SIX-AXIS ARDUINO CONTROLLED ROBOTIC ARM FABRICATED THROUGH ADDITIVE MANUFACTURING (AM) TECHNOLOGY

Raichur S.; Ravi Kumar R.; Hareesh A.; **Girish B.M.**; Satish B.M.; Shubha S.

Lecture Notes in Networks and Systems Conference Paper 2025

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Abstract

In the past decades due to Industrial 4.0 Revolution, as a type of Additive Manufacturing (AM), Fused Filament Fabrication (FFF) has gained importance in generating prototypes for enhancing capabilities in design domains for manufacturing sector. Additive manufacturing has become versatile advanced manufacturing technology to produce intricate parts which finds wide applications in aerospace, automotive, medical and construction field. This work involved the design and fabrication of 6-axis Eclectic controlled Robotic Arm developed using additive manufacturing technology. On the other hand, in this today's world of globalization, every manufacturer tries for attaining quality products to strengthen supply chain. It is not possible for all industrialist to invest for complete automate the process of manufacturing. Therefore, keeping above to objectives of manufacturing, author has focused to develop customized 3D printed Robotic Arm for the pick and place industrial applications. Apart from industrial applications, this developed robotic arm can be utilized for academic purpose among students' community, as the cost of this robotic arm is economical. This 3D printed robot arm is controlled by Servo-drives and Arduino microcontroller. The main advantage of this robot has been its 6-axis of degrees of freedom which is controlled by Android app with Bluetooth technology interfacing. There are other features which can be enhanced by customizing the programming for other suitable industrial applications. The robotic arm is built by using materials such as ABS (Acrylonitrile Butadiene Styrene) which is the common filament used in 3D printing. The author finds difficulty while fabricating the connecting link of the robot arm due to the curling or warping behavior of ABS material. This phenomenon happens mainly due to fast shrinkage and bad adhesion or poorly levelled build plate during printing of first layer.
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Author keywords- 3D Printing; Acrylonitrile Butadiene Styrene; Additive Manufacturing (AM); Arduino; Degree of freedom; Fused Filament Fabrication

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

A REVIEW OF AUGMENTED REALITY IN HEALTHCARE: INNOVATIONS AND CHALLENGES

Rani P.; Lamba R.; **Ghantasala G.**; Sachdeva R.K.; **Sharma R.R.; Sungheetha A.**; Bathla P.

Lecture Notes in Networks and Systems Conference Paper 2025

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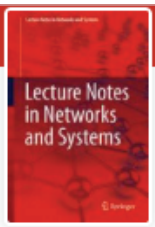

Book series
Lecture Notes in Networks and Systems

Abstract

Augmented reality (AR) is a technology that combines real world with virtual world. It has many impacted many sectors including healthcare, manufacturing, and education, etc. In healthcare, it has many advantages like improving patient care, medical education, and surgical procedures. In this paper, authors have reviewed various articles to analyze the applications of AR in healthcare, its challenges, and potential future improvements. No technology comes without limitations. Although AR technology has many advantages, there are significant challenges that need to be solved including technological constraints, legal restrictions, and ethical issues. This paper provides a comprehensive overview of AR technology including applications and challenges. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2025.

Author keywords- Augmented reality; Google glass; Head mounted displays; HoloLens

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

AN EFFECTIVE AND DEEP NEURAL NETWORK FOR BRAIN TUMOR SEGMENTATION AND DETECTION

Saravanakumar S.; **Senbagavalli M.; Debnath S.**; Sekaran R.; Parasuraman M.; Kallam S.; Madhavi K.R.

Lecture Notes in Networks and Systems Conference Paper 2025

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Abstract

A malignant brain tumor is a tumor that has spread across the brain and is threatening human health. Correctly dividing tumors into subtypes and classes is essential for later prognosis and therapy planning. Identifying a brain tumor can be a tedious and error-prone process, hence radiologists need to use automation whenever possible. This paper presents conditional deep learning for structural multimodal MRIs of the brain to perform tumor categorization using a residual network, survival rate forecasting, and dissection, to name a few. To begin, we recommend a segmentation method that separates non-overlapping regions using a combination of conditional random fields and convolutional neural networks. Using these patches, finding the tumor takes hardly no time at all. Errors multiply if their scopes cross. In the paper's second section, the authors provide a method of feature mapping using a residual network and XG-Boost for training models. The following part focuses mostly on these two topics since they are related to the reduction of information loss and the improvement of tumor data quality, respectively, through the use of residual features and nonlinear space mapping. The XG-Boost-learned mapping of features enhances structural-based learning and boosts accuracy across classes. A cancer dataset and a non-cancer dataset, as well as a meningioma, glioma, and pituitary dataset, are used in the experiment. Both areas saw dramatic performance boosts compared to alternative methods. The primary focus of this study is on enhancing segmentation and its implications for measures of classification efficiency. The use of a residual network and a conditional random field helps to improve the quality. The outcome is a 3.4% increase in accuracy across a two-class threshold and a 2.3% increase over a three-class threshold. A short convolutional network is used to improve it. Therefore, we conclude that greater segmentation with fewer resources leads to more accurate categorization of brain tumors.

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Author keywords- clinical data; computed tomography; enhancing segmentation; positron emission tomography; XG-Boost-learned mapping

Indexing/Quartile	Percentile	Impact Factor	SDG
SCOPUS/NA	NA	NA	07 AFFORDABLE AND CLEAN ENERGY

OPTIMIZING ENERGY EFFICIENCY IN SMART HEALTHCARE SYSTEMS USING AN IMPROVED ENUMERATION ALGORITHM FOR 5G-IOT

Thomas A.K.; Viji A.J.; Gunavardini V.; Balakrishna B.; Mishra S.; Lathigara A.

4th IEEE International Conference on Distributed Computing and Electrical Circuits and Electronics, ICDCECE 2025
Conference Paper 2025

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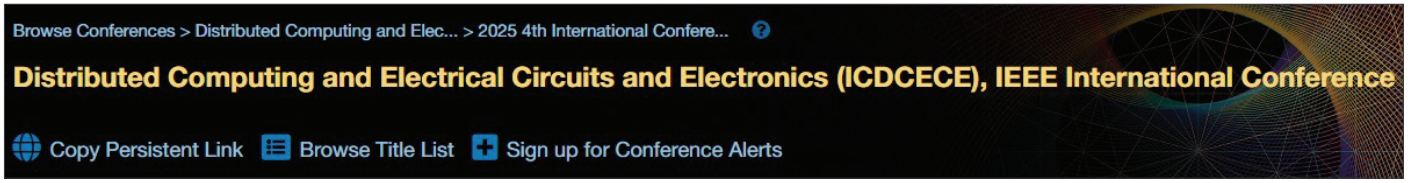
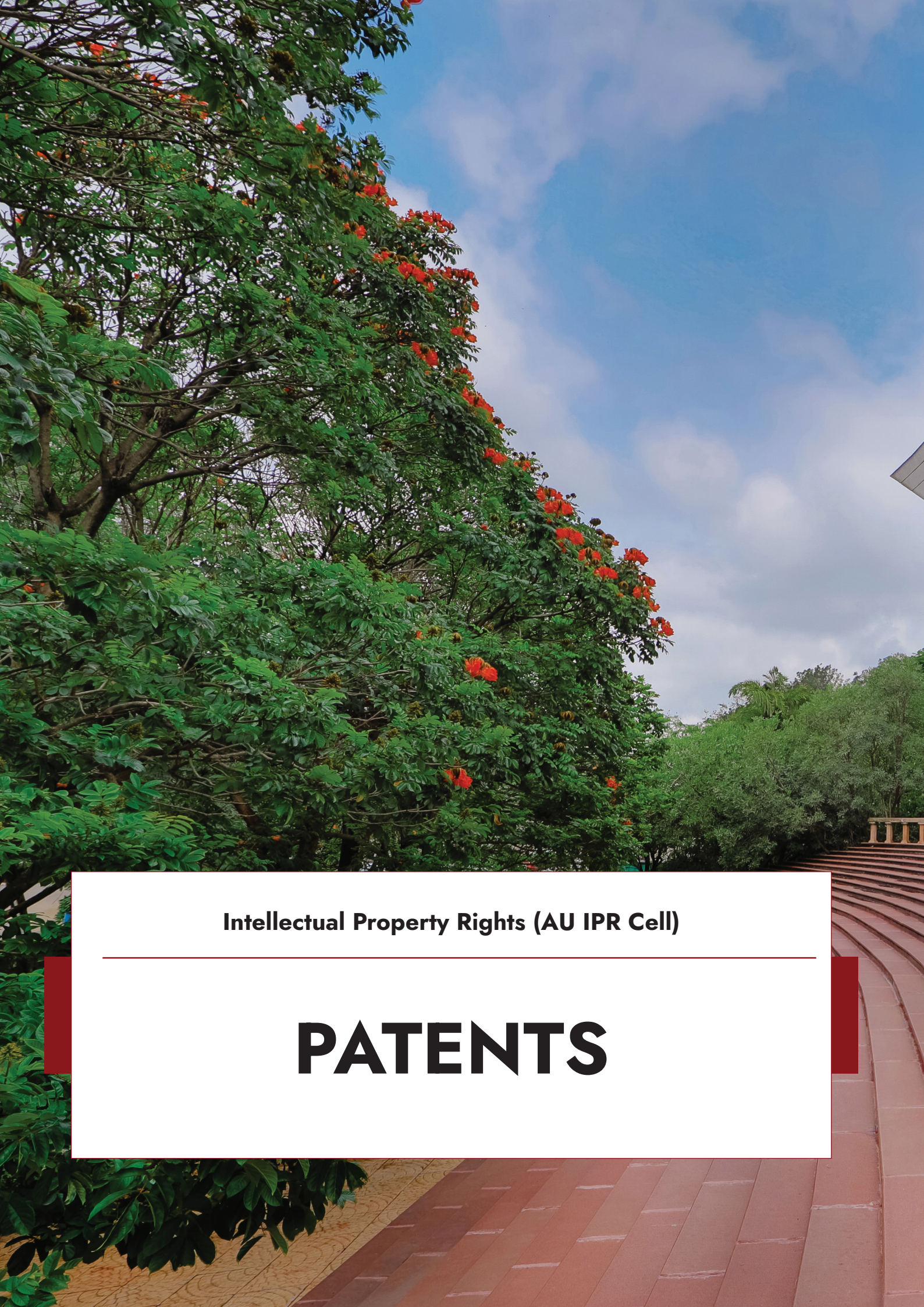


Abstract

High-power radio connection, such as that provided by the Fifth Generation (5G) in the transmission of data, is necessary for IoT devices in order to provide immediate surveillance on patients. In the field of healthcare, the fast implementation of IoT equipment that is allowed by 5G has brought about a revolution by giving capabilities to measure and diagnostics that are both efficient and real-time. These issues include the fact that there is not a standard structure for dealing with the apps, that there is not enough of resource improvement, which results in the waste of bandwidth on the networks, that there is a lack of resources that are environmentally conscious, and that the primary worry is the lack of fraudulent information or the privacy of private healthcare information. For the purpose of enhancing the thermal effectiveness in uplink transfer, an enhanced Optimal Enumeration Algorithm (OEA) with Proximity based Service (ProSe) has been suggested for use in Device-to-Device (D2D) communications. Furthermore, the findings of the simulator demonstrate that the better outcomes are achieved with greater energy utilization and reduced computing difficulty that is achieved. Outperforming both OEA and Round Robin, the Improved OEA (Proposed Method) attains an accuracy of 92.89%. © 2025 IEEE.

Author keywords- AS; D2D; IoT; MIMO; MME; OEA; prose; QOS; TGP



Intellectual Property Rights (AU IPR Cell)

PATENTS

Application No **202541060502**

Title of the invention **AN AI-POWERED REVIEW MOOD BOARD SYSTEM FOR PRODUCT DESIGNERS**

Dr. Rekha R. Nair
Assistant Professor
Alliance School of Advanced Computing

Name of Inventor: Amrithkala M Shetty, Dr. Manjaiah D H, Kishore S, and **Dr. Rekha R. Nair**

Abstract

Disclosed herein is an AI-powered review mood board system for product designers (110) comprises a data ingestion module (102) configured to automatically collect user-generated product reviews from multiple sources. The system also includes a natural language processing (NLP) engine (104) configured to classify emotional states across at least nine distinct emotions using a hybrid emotion lexicon. The system also includes an insight generation layer (106), comprising topic modeling algorithms, self-attention mechanisms and mechanisms to derive emotion-weighted key phrases indicating design-relevant insights. The system also includes an adaptive visualization module (108) configured to generate role-specific interactive dashboards tailored for designers, product managers, or quality teams. The system also includes an integration framework (110) configured to automatically translate prioritized emotional insights into actionable design tasks. The system includes a non-transitory computer-readable medium (112) storing instructions that, when executed, cause the system to visualize emotion-intensity trends over time and trigger compliance alerts.

Application No **202541061573**

Title of the invention **A SYSTEM AND A METHOD TO ASSESS THE IMPACT OF GOVERNMENTAL INTERVENTIONS ON THE AUTONOMY AND FUNCTIONING OF MINORITY EDUCATIONAL INSTITUTIONS IN INDIA**

Dr. Smita Satapathy
Assistant Professor
Alliance School of Law

Name of Inventor: Subin Thomas, **Dr. Smita Satapathy**

Abstract

The present disclosure relates to a system and method to assess the impact of governmental interventions on Minority Educational Institutions (MEIs) in India, with a focus on evaluating compliance with Article 30(1) of the Indian Constitution. The system comprises a data acquisition module for collecting structured feedback from students and administrators, an impact analysis module for classifying intervention effects across dimensions such as institutional autonomy, educational quality, and minority character preservation, and a legal compliance evaluator for constitutional benchmarking. A visualization and reporting interface provides real-time summaries and alerts based on severity thresholds. In one embodiment, the system includes a machine learning engine that refines classification accuracy using historical case data. The method enables empirical, constitutionally grounded assessment of state actions affecting MEIs, facilitating policy transparency, accountability, and minority rights protection. The invention offers a scalable and replicable framework to support legal scholars, policymakers, and educational administrators in monitoring and safeguarding institutional autonomy.

Application No **202541064523**

Title of the invention **AI-POWERED CONSUMER BEHAVIOR PREDICTION SYSTEM FOR DYNAMIC MARKETING STRATEGIES**

Poornima Nair
Assistant Professor
Alliance School of Business

Name of Inventor: Sunita Kumar, A. Sridharan, and **Poornima Nair**

Abstract

The proposed invention, titled AI-Powered Consumer Behavior Prediction System for Dynamic Marketing Strategies, introduces an intelligent marketing framework that leverages artificial intelligence, machine learning, and real-time analytics to predict and influence consumer behavior. The system collects, processes, and analyzes multidimensional consumer data from various sources including social media, e-commerce, and IoT devices to construct adaptive user profiles and forecast purchase intentions. Using advanced algorithms such as neural networks, natural language processing, and reinforcement learning, it delivers personalized marketing strategies, dynamic content recommendations, and automated campaign deployment. The system supports real-time sentiment analysis, behavioral clustering, and predictive scoring while ensuring ethical data usage and compliance with global privacy standards. It is scalable across industries and adaptable to diverse market environments. By enabling proactive, data-driven, and emotionally intelligent engagement, the invention significantly enhances marketing effectiveness, customer retention, and brand loyalty, offering a transformative solution for businesses in the digital era.

Application No **202541065176**

Title of the invention **INTELLIGENT EDGE-BASED UPSKILLING FRAMEWORK FOR REMOTE WORKFORCE ENABLEMENT AND LEARNING EQUITY**

Dr. G. Rajasekar
Professor
Alliance School of Law

Name of Inventor: Dr Saritha Mididoddi, Mrs. P. Saraswathi, Rosanth I, V. Nirmalkumar, Dr. Raman K Attri, **Dr. G Rajasekar**, Prof. Shivanand, and Bhimashankar Konade

Abstract

Intelligent Edge-Based Upskilling Framework for Remote Workforce Enablement and Learning Equity, introduces a transformative, AI-powered platform designed to democratize access to skill development and professional training for geographically distributed and underserved workforce populations. As remote and hybrid work environments become the norm, traditional centralized learning systems fall short in addressing disparities in digital infrastructure, bandwidth limitations, and real-time personalization needs. This framework leverages Edge Computing to process and deliver learning modules, AI-driven assessments, and adaptive content recommendations locally at the user's device or nearest edge node, significantly reducing latency and enhancing user experience even in low-connectivity regions. The system integrates machine learning algorithms for dynamic learner profiling, performance tracking, and predictive analytics to continuously tailor upskilling pathways according to individual goals, job roles, and industry trends. It also features multi-modal content delivery—including video, audio, and text—to accommodate diverse learning preferences and abilities. Furthermore, the framework supports multilingual capabilities, accessibility compliance, and offline caching mechanisms, ensuring inclusion across socio-economic and linguistic barriers.

Application No **202541066641**

Title of the invention **A SYSTEM AND METHOD FOR EVALUATING AND SELECTING GREEN SUPPLIERS USING A FUZZY ANALYTICAL HIERARCHY PROCESS (FAHP) APPROACH**

Dr. Chitra Kiran N
Professor
Alliance School of Applied Engineering

Name of Inventor: **Dr. Chitra Kiran. N**, Dr. Heena Kouser, Dr. G. Lakshmi, Srinath G M, Dr. Jyothirmayi M, Prof. Anil D, Dr. Aarathi S, Dr. S. Gnanamurthy, and Mr. Darshana A

Abstract

The present invention discloses a system and method for evaluating and selecting green suppliers using a Fuzzy Analytical Hierarchy Process (FAHP) approach. The system incorporates a hierarchical evaluation structure, fuzzy logic-based computation modules, supplier data integration, and collaborative decision-making interfaces to assess suppliers based on environmental and operational criteria. Linguistic judgments provided by experts are converted into fuzzy numbers, normalized, and defuzzified to calculate weighted scores for each supplier. The system outputs a ranked list of suppliers, along with sensitivity analysis and graphical reports, enabling organizations to make transparent, datadriven, and environmentally responsible procurement decisions.

Application No **202541068959**

Title of the invention **E-COMMERCE DRIVEN FRAMEWORK FOR OPTIMIZED SUPPLY CHAIN AND REDUCED OPERATIONAL COSTS**

Dr. Anusuya Biswas
Associate Professor
Alliance School of Business

Name of Inventor: **Dr. Anusuya Biswas**, Dr. Rani Pal, Dr. Manoj Sain, Dr. V. Kannan, Dr. B. Charwak, CMA Maithili Malpure, Mrs. Sudharani. M, Mrs. Geetha S, Prof. (Dr.) Parul Goyal

Abstract

The present invention discloses an e-commerce-driven framework designed for optimized supply chain management and reduction of operational costs through the integration of advanced digital technologies. The system employs Artificial Intelligence, Machine Learning, Internet of Things, Big Data Analytics, and cloud computing to unify procurement, inventory, logistics, and customer fulfillment in a single intelligent platform. It facilitates real-time data sharing, predictive demand forecasting, automated inventory control, and AI-powered logistics planning to enhance operational efficiency, minimize costs, and ensure seamless customer service. The invention promotes collaborative supply chain management, sustainability, and risk mitigation by leveraging integrated tools for monitoring, performance analysis, and adaptive decision-making. The scalable, user-friendly platform empowers businesses to meet the dynamic demands of the e-commerce environment while fostering transparency, cost-effectiveness, and customer satisfaction. This comprehensive system transforms traditional supply chain operations into an agile, technology-enabled network aligned with modern digital commerce needs, ensuring business growth and operational excellence.

Intellectual Property Rights (AU IPR Cell)

DESIGNS

Design No: **449490-001**

Title of the Design:

ARTISANAL TIMEKEEPING WRISTWATCH

Name of Applicant:

Prithwiraj Chaudhuri, Shipra Roy, **Ajay Verma, Sayantan Mukherjee, Shromona Neogi, and Pratima Verma**

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Assistant Professor
Alliance School of Business

Mr. Sayantan Mukherjee
Assistant Professor
Alliance School of Business

Ms. Shromona Neogi
Assistant Professor
Alliance School of Business

Dr. Pratima Verma
Professor & Area Chair – HRM
Alliance School of Business

Description

This artisanal timekeeping wristwatch features a hand-crafted mechanical movement within a finely polished dial, paired with a premium leather strap for timeless elegance. Combining traditional horology with precision engineering, it delivers accurate timekeeping while serving as a wearable masterpiece of artistry and sophistication.

Design No: **455542-001**

Title of the Design:

AI-BASED HUMAN RESOURCE MANAGEMENT DEVICE

Name of Applicant:

Sagar Vijay Kulkarni, Dr. Ashish A Kulkarni, Dr. Pooja A Kulkarni, and **Dr. Chetan Shelke**

Dr. Chetan J Shelke
Associate Professor
Alliance School of Advanced Computing

Description

This AI-based Human Resource Management device features intelligent algorithms that analyze employee data to optimize recruitment, performance evaluation, and workforce planning. Designed for organizations and HR professionals, it delivers real-time insights for strategic decision-making, enhancing efficiency and productivity.

Design No: **453588-001**

Title of the Design:

AI BASED CURRENCY COUNTING MACHINE

Name of Applicant:

Dr. G. Yoganandham, **A. Ezil Sam Leni**, Mr. Bhanu Prakash R, Ms. Sakeerthi S, Sithananthan K, Dr. N. Nagabhooshanam, and Dr. C. M. Kishore

Dr. A. Ezil Sam Leni

Professor
Alliance School of Advanced Computing

Description

This AI-based currency counting machine features advanced recognition algorithms that accurately count, detect, and authenticate banknotes with high speed and precision. Designed for banks and businesses, it enhances cash handling efficiency while minimizing errors and preventing counterfeit circulation.

Design No: **6454954**

Title of the Design:

AI-POWERED COMPUTER DEVICE FOR GENERATING SOCIAL MEDIA CONTENT FOR SMALL BUSINESSES

Name of Applicant:

Dr. Shilpa S Chadichal, and Santosh Chadichal

Dr. Shilpa S Chadichal
Associate Professor & Program Director - UG
Alliance Ascent College

Description

This AI-powered computer device generates tailored social media content by analyzing business profiles, target audiences, and market trends to create engaging posts and visuals. Designed for small businesses, it streamlines digital marketing efforts, saving time while enhancing brand visibility and customer engagement.

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