ICCRESMA 2026

International Conference on
Contemporary Researches in Engineering, Science, Management & Arts

(ICCRESMA 2026)

Created & Powered by

Centre for Research & Training (CRT)
National Foundation for Entrepreneurship Development (NFED)
Coimbatore, Tamil Nadu, India

In Association With

Technovate Educational & Consulting Services (TECS)
Coimbatore, Tamil Nadu, India

29 – 31 January 2026

Edited By
KVM. Prof. Dr. R. Ganesan
&
Dr. K. Ramya

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Greatness of Any Research Work is Only through its Wider Applicability

- KVM. Prof. Dr. R. Ganesan

Conference Proceedings

Acknowledgements

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Sd/-

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ICCRESMA 2026

Conference Blurb

The reality of conducting any research is to impart wisdom and growth in a society. The research contributions in the past have witnessed only interim growth and societal development. This situation continues due to unidisciplinary focus, wherein lack of integration of research across various disciplines remains untapped in many areas. The current global scenario is ever-changing and demanding, wherein the sustenance and livelihood will be more challenging in the ensuing years. Furthermore, the knowledge sharing through congregation of research across inter-disciplines and multi-disciplines for upbringing the overall socio-economic development and progression is quite indispensable.

Today's globalization has nurtured advancements in science & technology, entrepreneurial innovations, ergonomic practices, etc. due to IT interventions and digitalization. This has triggered the new gamut in the research arena, and it needs to address the upcoming trends in all sectors towards bringing in a holistic development. Hence, there is a need to holistically gauge the overall requirements of mankind in terms of achieving socio-economic sustenance and global stability.

Keeping these above-mentioned aspects in view, the international conference intends to focus on the paradigms of research innovations in the disciplines of sciences, engineering, technology, entrepreneurship, management, arts, humanities, and other inter-disciplinary contributions to have wider knowledge integration. Also, to envisage the future challenges through a radical approach for the betterment of mankind.

Hence, the conference has been officially coined by the Conference Chair & Chief Patron as 'International Conference on Contemporary Researches in Engineering, Science, Management & Arts' – ICCRESMA '2026 with a Theme: Contemporary Research Contributions Towards Holistic Global Restructuring to garner the inter-disciplinary and multi-disciplinary research contributions across the nation and globe. This international conference has been created and powered by Centre for Research & Training (CRT) – A Growth Action Unit under the renowned National Foundation for Entrepreneurship Development (NFED), Coimbatore, Tamil Nadu and officially scheduled on 29-31 January 2026.

Sd/-
KVM. Prof. Dr. R. Ganesan
Conference Chair & Chief Patron, ICCRESMA '2026
&
Founder Chairman & Presidium Chair, NFED

ICRESMA 2026

Conference Objectives

To highlight the holistic research innovations in accordance with current trends and future challenges for bringing in the socio-technological transformation

To congregate the research trends across various domains for upbringing socio-economic development and sustenance

To act as a global platform for knowledge sharing of various research contributions towards societal upliftment and global development

To encourage and promulgate the research acumen of young students, budding researchers, scholars, academicians, entrepreneurs, industrialists, practitioners and aspirants

NFED is a unique organization which is predominantly into promulgating entrepreneurship cult across the nation and globe. NFED is driving and thriving on socialistic notion with righteous academicians, corporate citizens, and entrepreneurs in its fold, which is established as virtual organization, since 2003 and registered as a Trust on 7th November 2013 towards accomplishing its mission 'In Pursuance to Create Socio-economic Sustenance through Entrepreneurship Development'. It is headquartered at Coimbatore District, Tamil Nadu, India. Moreover, all the pertinent information regarding NFED and its activities are floated in its official websites for wider reach.

NFED primarily aims in creating enterprising communities at large in Schools, Colleges and Varsities through its training and development activities, faculty development programmes on research and entrepreneurship development, awareness, workshops, refereed conferences, seminars, etc. pertaining to Management Development, Research Emancipation, Technology Innovation and Entrepreneurship Development. It frequently engages in research and development activities by conducting national & international conferences, publishing research articles, book chapters and edited books on holistic research, which congregates the disciplines like, engineering, technology, sciences, management, arts, and humanities alongside women development. To accomplish this mission, it has established Centre for Research & Training (CRT) – A Growth Action Unit of NFED alongside it launched Technology-Information-Management-Entrepreneurship-Review (TIMER) – International Multidisciplinary Refereed Journal for encouraging innovative research publications. It also recognizes the real talents of teachers, academicians, researchers, professionals, entrepreneurs (including social entrepreneurs), practitioners, freelancers, etc. especially women through its National Awards since 2010.

NFED encourages the entrepreneurial spirit of youths and facilitates them with opportunity guidance through its NFED Business Facilitators Forum (NBFF) – A Strategic Action Unit of NFED. NFED also serves under a glocal perspective to bring in prosperity by and large to foster entrepreneurial progression across the nation amongst all communities in general and women in particular. It has associated and collaborated with various academia ranging from schools, colleges, varsities, etc. and national & international organizations. It has instituted numerous programmes hitherto towards fostering entrepreneurship development, career development, skill development, research & development, women empowerment, etc.

Centre for Research & Training (CRT)

Centre for Research & Training (CRT) is a growth action unit under National Foundation for Entrepreneurship Development (NFED) initiated on 7th November 2015 with a goal to bring in quality research and promulgate enterprising faculties within the globe. CRT aims to bring in research and development climate through addressing mainstream aspects of research such as research structuring, research insights, publication process and publication strategies, thereby creating and nurturing research acumen within the aspirants across academia and industry. In addition to this, it also frequently engages in conducting Faculty Development Programmes (FDPs), Research Orientation Programmes (ROPs), Quality Publications (QPs) through infusing the importance of research and development. CRT has delivered more than 160 sessions and conducted numerous conferences, seminars, webinars, research workshops and faculty development programmes for understanding the new vistas in research and facilitating research career of academicians, scholars, practitioners, etc. at national and international levels.

NFED Business Facilitators Forum (NBFF)

NFED Business Facilitators Forum (NBFF) is a strategic action unit under National Foundation for Entrepreneurship Development (NFED) initiated on 7th November 2015 with a goal to congregate entrepreneurs to create an entrepreneurial cult across the globe and foster entrepreneurship development process. NBFF aims to bring in an entrepreneurial climate through encouraging youths and interested individuals to vent into entrepreneurial activities by providing the platform for fulfilling their business aspirations. Furthermore, to act interfacing plank for enhancing their motivation and inclinations to become prosperous and potential entrepreneurs. In addition to this, it also insists on business growth through the concept of interdependence by creating channels and integrating entrepreneurial talents for collective existence, sustenance and survival. NBFF has delivered more than 130 sessions and conducted numerous national seminars & workshops, international and national webinars in entrepreneurship fundamentals & emerging trends, facilitating entrepreneurship development among teaching faculties and promulgating entrepreneurial acumen of students across the nation.

NFED Publications

NFED believes that greatness of any research work is only through its wider applicability. Our academic and research aim is not only to publish a quality-centric book with ISBN but also to provide a strong reference and splendid foundation for research emancipation towards holistic research thereby attaining integrated knowledge development and overall nation building. NFED's publications focus on understanding various challenges in society, not only at the perspective level, but also in various realms of research that are conducted towards upbringing the socio-economic and socio-technological development, which strives to facilitate the future generations to compete with excellence in innovation. Also, it intends to congregate and upbring the innovative research and its new vistas in terms of science, engineering, applications, approaches, policy initiatives, enterprise development, technology innovation, case studies, strategies, systems, best practices, problems, factors, challenges etc. pertaining to research and development through genuine research findings for achieving overall development. NFED publications has completed 45 published works, which include books, edited books, award compendiums, ready reckoners and conference proceedings.

Technology-Information-Management-Entrepreneurship - Review
(TIMER - A Multidisciplinary Refereed Journal of NFED)

Technology-Information-Management-Entrepreneurship-Review (TIMER) is an International Online Multidisciplinary Refereed Journal (Open Access) under the aegis of National Foundation for Entrepreneurship Development (NFED), Tamil Nadu, India with E-ISSN: 2584-1602. The key objective of TIMER is to publish new vistas in research domain and to promulgate scientific advancements & innovations in terms of info-engineering, info-technology, techno-innovation, techno-management, techno-sciences and techno-arts. It will function as a torch bearer to academia and industrial research to be at par with global advancements by envisaging into Social, Economical, Environmental and Entrepreneurial Avenues. The journal intends to congregate the Diverse Disciplines of Engineering, Technology, Management, Entrepreneurship, Basic & Life Sciences, Medical & Paramedical Sciences, Social Sciences and Arts & Humanities through appropriate inventive cum innovative research and development activities on inter-disciplinary avenues, which is of prime importance for enhancing socio-economic sustenance, educational excellence, nation building and global restructuring with talent convergence. It welcomes original, empirical, experimental, conceptual, contextual, analytical papers / articles / manuscripts / cases using appropriate research structuring.

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KVM. Prof. Dr. R. Ganesan

Karma Veer Maharatna. Professor Dr. R. Ganesan earned his doctorate from the reputed IIT Delhi with a special focus on Entrepreneurship Development. He possesses more than 26 years of research experience in the field of entrepreneurship and management. He has served in different academia ranging from Deemed Varsities, Engineering Colleges, Arts & Science Colleges, B-Schools, and International Varsities. He has more than 85 research contributions to his credit, which are published in refereed and indexed journals, books, book chapters, monographs, and conferences. He is a global author in Women Entrepreneurship, whose research papers are listed in Google Scholar and indexed in Web of Science ISI (AHCI & ESCI), MLA Citations, Scopus, ABDC, EBSCO, Cabells' Directory, etc. Also, globally referred and cited by the authors in research gate. He has authored two books on women entrepreneurship development and insurance management, which have been published at Germany. He has edited and published more than 30 edited books. He is serving as an editorial member and reviewer for numerous journals and possesses more than 23 years of editorial experience. He has edited more than 1045 research articles and chapters to his credit, which includes his editorial experience across refereed and indexed journals, conferences and book chapters at national & international levels. He has organized and hosted more than 90 academic events and entrepreneurship development programmes, which includes 3 national conferences, 9 international conferences, 4 international seminars and 55 faculty development programmes (FDPs) respectively. He has delivered more than 300 national and international sessions (including webinar sessions) on Research & Development (Research Insights, Research Structuring, Publication Strategies, Statistical Insights, Crafting Literature Review and Publication Prospects), Entrepreneurship Development, Innovation, Managerial Skills, Career Development, Self-Management, Design Thinking, Employability Skills, Digital Marketing, Education Development, etc. He has inaugurated many Entrepreneurship Development Cells

(EDCs) across the nation. He is the Chief Mentor for certification programs on E-Entrepreneurship and Innovation & Creativity for Business and Soft Skill Courses (Personality Development & Leadership Quality and Development). He has a deep inclination towards bringing up social sensation across communities and has hosted & organized 38 national award ceremonies for recognizing national and global talents. Also, he has an exorbitant interest in Tamil Literature, wherein he has written and published Agakurals (Voice of Self) for civility and few Traditional Poetries for self-realization and societal development. He has written proverbs, quotes and slogans on 'Self-Management', which are published in numerous edited books, award compendiums, conference proceedings, etc. In commemorating his laudable academic, research and societal transformational services through upbringing entrepreneurship development, he has been conferred with the prestigious title Karma Veer Jyoti (KVJ) by Indian Confederation of Non-Governmental Organizations (iCONGO), New Delhi, India on 22nd March 2015. He is the recipient of PFLA Excellence Award for his 'Outstanding Service to Education and Entrepreneurs' community from People First Leadership Academy (PFLA), Bengaluru, Karnataka on 19th January 2019. He has been conferred with 'Order of Eminence' the highest honour for his global contribution to research, teaching, and training in Entrepreneurship Development by the Presidium of NFED in its 10th National Teachers' Day Awards on 5th September 2019 at Coimbatore, Tamil Nadu. He has been conferred with the Prestigious MTC Global Distinguished Teacher Award in Entrepreneurship Development in the 9th World Edu Summit organized by Management Teachers Consortium (MTC) Global on 7th September 2019 at Bengaluru, Karnataka. He has been bestowed with the prestigious Pride of India Award by South Asian Institute for Advanced Research and Development (SAIARD), Kolkata, West Bengal on 16th October 2022. He has been bestowed with Karma Veer Maharatna (KVM) by Indian Confederation of Non-Governmental Organizations (iCONGO), New Delhi, India under Social Justice & Citizen Action for his lifelong services towards bringing Social Transformation through Entrepreneurship Development on 26th November 2024 at Noida, Uttar Pradesh. In recognizing his immense contribution to Innovation and Development he has been endorsed with the coveted Global Leadership Award on 7th December 2024 in the International Conference on Interdisciplinary Research in Technology & Management (IRTM)-December 5-7 '2024 conducted at NIT Calicut, Kozhikode, Kerala organized by Institute of Engineering & Management (IEM) - University of Engineering & Management (UEM) Group, Kolkata, West Bengal. He has been conferred with the prestigious Lifetime Excellence Award for his exemplary service, visionary leadership and outstanding contributions to entrepreneurship and education by Masters Professional Academy (MPA), Coimbatore, Tamil Nadu on 4th May 2025. He is the Founder Chairman and Presidium Chair of the renowned National Foundation for Entrepreneurship Development (NFED) and Founder & Chief Executive Officer of Technovate Educational & Consulting Services (TECS), Coimbatore, Tamil Nadu. He is the Founder and Editor-in-Chief of Technology–Information–Management–Entrepreneurship–Review (TIMER) – A Multidisciplinary Refereed International Journal under the aegis of NFED since 2023. Also, he is the Chief Mentor & Chair of NFED Business Facilitators Forum (NBFF) – A Strategic Action Unit, Centre for Research & Training (CRT) – A Growth Action Unit and NFED Publications respectively under the ambit of NFED, Coimbatore, Tamil Nadu, India. He is serving as the Honorary Advisor in the reputed LTT Global Communications Sdn. Bhd., Kuala Lumpur, Malaysia since February 2025.

Conference Director & Patron

Dr. Ramya Kandavel

Dr. Ramya Kandavel holds Doctorate in Women's Studies, has Master's in Statistics from University of Madras and Master's in Applied Psychology from Bharathiar University. She also has a Diploma in Transactional Analysis from South Asian Association of Transactional Analysts (SAATA). She is a Psychological Counsellor and a Master Practitioner in Neuro-Linguistic Programming. Her expertise as a counsellor includes Personal One-to-One Counselling, Psychotherapy, Stress Management and Dream Interpretation. She has published her research work in leading journals, book chapters in edited books and presented papers in numerous research conferences. She commenced her professional career in the ITES Sector and possesses more than 22 years of administrative experience at various corporates and academic institutes. She joined as an active member in the renowned National Foundation for Entrepreneurship Development (NFED) and has facilitated its national events as Event Anchor, Programme Coordinator, Programme Director, Chief Coordinator and Conference Director. She has hosted and organized 9 international conferences, numerous faculty development programmes (FDPs) and webinars focusing on research & development, entrepreneurship development, digital marketing, etc. at national and international levels. Currently, she is serving as the Executive Chairman & Director and Treasurer of the NFED Trust, Coimbatore, Tamil Nadu, and functioning as the Chief Coordinator and Member Secretary of various units of NFED viz. NFED Business Facilitators Forum (NBFF), Centre for Research & Training (CRT) and NFED Publications. Also, she is the Chief Coordinator of Technovate Educational & Consulting Services (TECS), Coimbatore, Tamil Nadu. She oversees the entire administrative activities of NFED to promulgate its social sensational and professional development programmes across the nation and globe.

Conference Convener

Dr. V. Sunitha

Dr. V. Sunitha earned her Post Graduate degree in Geology from Sri Venkateswara University, Tiruapti and Doctor of Philosophy (PhD) from Department of Applied Geochemistry, Osmania University, Hyderabad and in 2007 joined as Assistant Professor in Yogi Vemana University, Kadapa, Andhra Pradesh, India. She received the Raman Post Doctoral Fellowship from University Grants Commission (UGC) in 2016 and worked as a Post-Doctoral Fellow at Miami University, Oxford, USA in 2016-17, wherein she carried out urban pollution studies at Gary Indiana, USA. She has contributed significant work on Quality Characterization of Groundwater and Risk Assessment using Geospatial and statistical tools in Southern Andhra Pradesh. She is the recipient of Young Scientist award from department of Science and Technology (DST), India.

She has authored 90 SCI Journal articles. She attended more than 70 national and international conferences and workshops in India and abroad. She has guided 4 PhDs, 13 M.Sc. projects and 2 funded research projects by DST and UGC respectively. She is also serving as a reviewer for several reputed National and International Journals. She is a member of many International and National Scientific bodies viz., Indian Geological congress (IGC), Geological Society of India (GSI), National Environmental Science academy (NESA), Indian Women Scientists Association, National Foundation for Entrepreneurship Development (NFED), Third World Organization for Women in Science and Technology (TWOWS), International Association of Hydrological Sciences (IAHS), United Kingdom. In commemorating her laudable academic accomplishments, she has been awarded with Andhra Pradesh Scientist Award 2020 for her contributions in the field of Geology and recipient of the Andhra Pradesh Best Teacher Award from Government of Andhra Pradesh and Best Woman Researcher Award - Narishakthi in

2022. Also, for her remarkable academic achievements she has consecutively received the Senior Educator & Scholar Award, Outstanding Women Educator & Scholar Award and Distinguished Woman Educator & Scholar Award for the years 2021, 2022 and 2023 respectively by the renowned NFED, Tamil Nadu. She is also the recipient of Best Programme Officer of NSS in Yogi Vemana University, India for the year 2023. She has been conferred as Distinguished Fellow by the presidium of NFED for her phenomenal research contributions. Presently, she is working as a Professor and Head of Geology, Yogi Vemana University, Kadapa, Andhra Pradesh, India.

Conference Co-Convener / Associate Convener

Dr. Suvashree Suvadarshinee

Dr. Suvashree Suvadharshinee is working as the Associate Professor of English in the Department of Basic Sciences and Humanities at Silicon University, Bhubaneswar, Odisha with over 18 years of teaching and research experience. She is guiding PhD scholars and serves as a thesis examiner. She has presented 17 research papers at national and international conferences, published 14 articles in reputed national and international journals (including Scopus-indexed publications), contributed four book chapters, and organized academic conferences. Three of her edited volumes are in the publication pipeline with broad topics of English Language Teaching, Indian Knowledge System and Post-Colonial Literature scheduled for release this year. She is an active editor and reviewer for four international journals and two national journals, actively contributing to the global academic community. Her research interests span American Literature, Contemporary Studies, Ancient Mythology, Folk Arts, Media Studies, Gender Studies, Literary Theory, Tribal Literature and Indian Knowledge Systems. In commemorating her splendid contributions, she has been bestowed with the prestigious Distinguished Educator & Scholar Award in the 15th National Teachers' Day Awards organized by National Foundation for Entrepreneurship Development (NFED) at Coimbatore, Tamil Nadu, India on 5th September 2024. Also, she has been conferred as Distinguished Fellow by the presidium of NFED for her significant research contributions.

Conference Co-Convener / Associate Convener

Dr. Darshana J. Desai

Dr. Darshana J. Desai is an accomplished academician, researcher, and technology leader with over 21 years of combined experience in academia and the IT industry. She has been serving for more than 16 years as an approved faculty member of Savitribai Phule Pune University (SPPU). She has over five years in the software industry as a Senior Software Engineer specializing in J2EE technologies. As a recognized PhD guide at SPPU, she mentors research scholars in emerging areas such as AI-driven personalization, data-driven decision systems, and educational data mining. She serves as an Editorial Board Member for international journals with Taylor & Francis (USA) and Mathematics and Computer Science Journal (SPG, USA), and as a reviewer for reputed publications including IEEE, Springer, and SAGE. She has authored and co-authored more than 20 research papers published in Scopus and Web of Science and published international book chapters under prestigious publishers such as Taylor & Francis and IGI Global (USA). She is also the co-author of the book 'Online Learning Systems: Methods and Applications with Large-Scale Data' published by Taylor & Francis, 2023 and holds an international patent on AI-based Airplane Accident Prediction in 2021.

She has gained two BCUD Research Grants from SPPU. Moreover, her work reflects a deep commitment to advancing digital transformation in education and empowering women-led research initiatives. Dr. Desai is a dynamic speaker and mentor, she has delivered expert sessions and FDPs on Artificial Intelligence, Data Science, Augmented Analytics, and Research Methodology at national and international forums. Her academic and research expertise spans Data Science & Analytics, Machine Learning, Big Data, Python, R Programming, Visualization Tools (Tableau & Power BI), Research Methodology and Object-Oriented Software Engineering. She has demonstrated exemplary leadership in academic

governance, emphasizing innovation, institutional development, research-driven education, and maintaining global standards. She has been guided by the philosophy of lifelong learning and continues to blend academic excellence with leadership vision, driving innovation in management and computer applications while fostering an environment of curiosity, creativity, and collaboration. In commemorating her professional excellence, she has been recognized with the Best HOD Award at the World Education Congress, Mumbai in 2022. Currently, she is serving as the Professor in MCA Department at Indira College of Engineering and Management (ICEM), Pune, Maharashtra, India. She has been a visionary educator and strategic thinker by being instrumental in curriculum design, leading NAAC and NBA accreditation processes, and establishing industry-academia collaborations for student internships and placements.

Conference Co-Convener / Associate Convener

Dr. G. Subhalakshmi

Dr. G. Subhalakshmi is a dedicated teaching faculty at the School of Law, Pondicherry University. Her academic journey has been nothing short of remarkable, as evidenced by her three prestigious gold medals. She secured the first rank in LLB, achieved the highest mark in the TP Act, and excelled in Civil Procedure Code. Her expertise extends to the fields of Labour and Administrative Law, where she specialized during her LLM. In addition to this, she holds Post Graduate Diplomas in HRM, NGO Management, and French Laws. Her diverse background and extensive experience in both law and languages make her an all-rounded educator. She possesses more than 10 years of teaching and research experience in the fields of Law, especially on laws relating to women and children, IPR, Labour rights, and Constitutional Law. She has published numerous articles in National and international journals, which are indexed in Scopus. She is an outstanding scholar who has authored edited, and contributed to numerous publications in contemporary areas of law. Notably, she has collaborated on edited books published by international giants like Routledge. She has served as the coordinator, keynote speaker, session chair for many international conferences, seminars, workshops, etc.

She has delivered more than 60 talks as special lecture and sessions on topics such as women and law, child rights, career in law, IPR, Constitutional rights and values, administrative law, labour rights, etc. She guides research scholars and functions as the doctoral committee member at both Central and State Varsities. She has guided more than 60 LL.M dissertations. She also functions as an expert reviewer to few national and international journals. She has actively engaged in many extracurricular activities like compering, anchoring and organizing

academic & cultural events, coordinating women's day functions, and judging many events too. In honoring her remarkable achievements, she has been bestowed with 'Young Educator & Scholar Award' and 'Distinguished Educator & Scholar Award' powered by National Foundation for Entrepreneurship Development (NFED), Coimbatore, Tamil Nadu on 13th National Teachers' Day Awards 2022 and 14th National Teachers' Day Awards 2023 respectively; 'Young Women in Law' in the Annual Women's Meet 2020 conducted on 7th March 2020 organized by Venus International Foundation; 'Dr. Sarvepalli Radhakrishnan Lifetime Achievement National Award' conducted by IRDP group of Journals on 23rd February 2020; 'Distinguished Researcher In Law' by RULA and World Research Council held on 26th January 2020. She has received the REX Karmaveer Global Fellowship and Karmaveer Chakra Award (2024-25) by iCONGO in partnership with the United Nations at Noida, Uttar Pradesh on 26th November 2024. Currently, she is serving as Assistant Professor and Head (i/c) in School of Law, Pondicherry University at Puducherry. She is an active member of many committees as legal experts and holds additional responsibilities like: Deputy Cultural Coordinator, Pondicherry University, Assistant Coordinator, IQAC, Pondicherry University, External Expert Member – Internal Compliance Committee (ICC) of Employees' State Insurance cooperation (ESI), Regional Office, Puducherry and External Expert Member – Ethics Committee, College of Nursing, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER).

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Conference Organizing Secretaries

Dr. Priti Srinivas Sajja
Professor & Director
Department of Computer Science & Technology
Sardar Patel University
Anand, Gujarat, India

Dr. Subhashini S
Professor
Centre for Research & Training (CRT)
National Foundation for Entrepreneurship Development (NFED)
Coimbatore, Tamil Nadu, India

Ms. Susmitha Deevenapalli
Founder & Managing Director
Suntowa Technologies Pvt. Ltd. (STPL)
Chennai, Tamil Nadu, India

Mr. Jaswin Kumar N. R.
Youth Facilitator & Technical Head
National Foundation for Entrepreneurship Development (NFED)
Coimbatore, Tamil Nadu, India

Conference Organizing Committee Members

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Department of Teacher Education
&
Dean, Students Welfare
Central University of Haryana
Mahendergarh, Haryana, India

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Approved Research Centre, Panjab University, Chandigarh, India

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New Delhi, India

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Patiala, Punjab, India

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&
Coordinator, Research & Development Cell
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Assistant Professor & Head
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Union Christian College
Aluva, Kerala, India

Dr. V. Sailaja
Assistant Professor
Department of Zoology
Vikrama Simhapuri University College
Kavali, SPSR Nellore District, Andhra Pradesh, India

Dr. Rufus D
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Department of Criminology & Police Studies
Sardar Patel University of Police, Security & Criminal Justice
Jodhpur, Rajasthan, India

Dr. Kiran Joshi
Assistant Professor
Department of Education
Mewar Institute of Management
Ghaziabad, Uttar Pradesh, India

Dr. A. Krishnarathi
Assistant Professor
Unity College of Teacher Education
Dimapur, Nagaland, India

Dr. Bhuvaneswari S
Assistant Professor
Department of Management Science
B.S. Abdur Rahman Crescent Institute of Science & Technology
(Deemed To Be University)
Chennai, Tamil Nadu, India

Dr. Vasudha Kurikala
Assistant Professor
Department of MBA
MLR Institute of Technology
Telangana, India

Keynote Speakers - Day I (29th January 2026)

Dr. S. A. Senthil Kumar
Professor & Registrar
National Institute of Technology (NIT), Tiruchirappalli, Tamil Nadu, India

Dr. Patrick Osa. Oviasuyi
Professor
Department of Public Administration, Faculty of Management Sciences
Ambrose Alli University, Ekpoma, Nigeria

Dr. Bhuvana Venkatraman
Professor
Department of Commerce
School of Studies of Commerce & Management
Guru Ghasidas Vishwavidyalaya (A Central University)
Koni, Bilaspur, Chhattisgarh, India

Dr. Sonam Bansal
Associate Professor & Chairperson
Department of Education, Faculty of Social Sciences & Education
&
Coordinator, Indian Knowledge System (IKS)
Gurugram University, Gurugram, Haryana, India

Dr. Parvathy Menon
Associate Professor
Department of History & Political Science
All Saints' College, Thiruvananthapuram, Kerala, India

Dr. Saslina Binti Kamaruddin
Senior Lecturer
Faculty of Management & Economics, Universiti Pendidikan Sultan Idris (UPSI)
Selangor, Malaysia

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Keynote Speakers - Day II (30th January 2026)

Dr. S. Kadhiravan
Senior Professor & Head, Department of Psychology
&
Dean, Faculty of Social Sciences & Syndicate Member
Periyar University, Salem, Tamil Nadu, India

Dr. Kavana G Venkatappa
Professor & Head
Department of Physiology
Haveri Institute of Medical Sciences
(Govt. Autonomous Institution)
Haveri, Karnataka, India

Dr. Glenn W. Muschert
Professor
Department of Public Health & Epidemiology
Khalifa University of Science and Technology
Abu Dhabi, United Arab Emirates

Dr. V. Arulmurugan
Associate Professor & Head
Department of Commerce, School of Management
Pondicherry University Karaikal Campus
Karaikal, Puducherry, India

Ms. Saeeda Ahmed
Founder & President
Sustainable Cities Global Ltd.
London, United Kingdom

Keynote Speakers - Day III (31st January 2026)

Dr. Lakshmi Mohan
Pro Vice Chancellor, ITM Skills University
&
Professor & Director, ITM Business School
Kharghar, Navi Mumbai, Maharashtra, India

Dr. Saikumari. V
Professor & Head
Department of Management Studies
SRM Easwari Engineering College, Chennai, Tamil Nadu, India

Dr. V. Sreevidya
Professor & Head
Department of Civil Engineering
Sri Krishna College of Technology (SKCT), Coimbatore, Tamil Nadu, India

Dr. Seetha Lakshmi
Associate Professor & Assistant Head (Tamil)
Department of Asian Languages & Cultures (ALC)
National Institute of Education (NIE)
Nanyang Technological University (NTU), Singapore

Dr. R. Deepalakshmi
Assistant Professor & Head, Department of Computer Applications
&
Director, Data Processing Centre
The Tamil Nadu Dr. Ambedkar Law University
Perungudi, Chennai, Tamil Nadu, India

Ms. Theviga Rani Wemel
Co-Founder & Chief Operating Officer
LTT Global Communications Sdn. Bhd., Kuala Lumpur, Malaysia

Valediction Keynote Speakers - Day III (31st January 2026)

Prof. Dr. S. Magesh
Chairman & Director
Magestic Technology Solutions (P) Ltd.
Chennai, Tamil Nadu, India

Dr. P. G. Sunanda Bhagavathy
Professor
Division of Criminology & Forensic Science
Karunya Institute of Technology & Sciences
(Deemed to be University)
Coimbatore, Tamil Nadu, India

Dr. Luzaan Hamilton
Associate Professor
School of Management Studies
North-West University (Vanderbijlpark Campus), South Africa

Dr. Pooja More
Programme Coordinator
Skill Development Centre
Savitribai Phule Pune University, Pune, Maharashtra, India

Dr. Nagarajan S
Assistant Professor
Department of Chemistry
National Institute of Technology (NIT) Manipur
Imphal, Manipur, India

Dr. Pratima Jagadeesh
Founder & Director
Crecers Academy
Bengaluru, Karnataka, India

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Session Chairs

Track 1 - Science, Engineering & Technology (SET)

Dr. B. Surekha
Professor
Department of CSE (IoT, Cyber Security & Block Chain Technology)
&
Dean (R & D)
K.S. Institute of Technology, Bengaluru, Karnataka, India

Dr. V. Sunitha
Professor & Head
Department of Geology
Yogi Vemana University
Kadapa, Andhra Pradesh, India

Dr. V. Sujatha
Professor & Head
Department of MCA
S. A. Engineering College (Autonomous)
Thiruverkadu, Chennai, Tamil Nadu

Dr. R. Rajeswari
Professor
Department of Electrical & Electronics Engineering
Government College of Technology (Autonomous)
Coimbatore, Tamil Nadu, India

Dr. M. Venkateshwarlu
Professor
Department of Civil Engineering
CMR College of Engineering & Technology
Hyderabad, Telangana, India

Dr. Gurumeet Singh
Vice Principal
&
Associate Professor & Head
P.G. Department of Mathematics
GSSDGS Khalsa College (Autonomous)
Patiala, Punjab, India

Dr. Thenmozhi G
Associate Professor
Department of Automobile Engineering
Kumaraguru College of Technology
Coimbatore, Tamil Nadu, India

Dr. R. Deepalakshmi
Assistant Professor & Head
Department of Computer Applications
&
Director, Data Processing Centre
The Tamil Nadu Dr. Ambedkar Law University
Perungudi, Chennai, Tamil Nadu, India

Dr. V. Sailaja
Assistant Professor
Department of Zoology
Vikrama Simhapuri University College
Kavali, SPSR Nellore District, Andhra Pradesh, India

Dr. Nagarajan S
Assistant Professor
Department of Chemistry
National Institute of Technology (NIT) Manipur
Imphal, Manipur, India

Dr. I. Raja Rajasri Pramila Devi
Curator
Sri Ramachandra Institute of Higher Education & Research
(Deemed to be University)
Porur, Chennai, Tamil Nadu, India

Track 2 - Management, Entrepreneurship & Innovation (MEI)

Dr. R. Ganesan
Professor & Chair
Centre for Research & Training (CRT) – A Growth Action Unit of NFED
&
Chairman
National Foundation for Entrepreneurship Development (NFED)
Coimbatore, Tamil Nadu, India

Dr. V. Sasirekha
Professor & Dean
School of Business
Galgotias University
Greater Noida, Uttar Pradesh (NCR), India

Dr. Nalla Bala Kalyan
Professor
Department of MBA
S.A. Engineering College (Autonomous)
Thiruverkadu, Chennai, Tamil Nadu, India

Dr. Lathangi R
Associate Professor
School of Management
Presidency University
Bengaluru, Karnataka, India

Track 3 - Arts & Humanities (AHU)

Dr. Beulah Shekhar
Adjunct Professor
Faculty of Law
Parul University
Vadodara, Gujarat, India

Dr. Anuradha Sekhri
Associate Professor
Institute for Development & Communication (IDC)
Approved Research Centre
Panjab University, Chandigarh, India

ICCRESMA 2026

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Conference Highlights

The Three-Day International Conference on Contemporary Researches in Engineering, Science, Management & Arts (ICCRESMA '2026) has completed numerous deliberations in terms of keynote address, valedictory keynote address, session chairing, paper presentations and participation across the nation and globe.

I intend to place the conference highlights in the capacity as Conference Chair & Chief Patron of ICCRESMA '2026 and Founder Chairman & Presidium Chair of National Foundation for Entrepreneurship Development (NFED), Coimbatore, Tamil Nadu, India.

This three-day international conference has exhibited 23 Keynote Addresses delivered by International Keynote Speakers from Nigeria, Malaysia, United Arab Emirates, United Kingdom, South Africa and Singapore and National Keynote Speakers from various States and Union Territory of India namely Tamil Nadu, Puducherry, Kerala, Karnataka, Maharashtra, Chhattisgarh, Haryana and Manipur respectively.

The keynote speakers of this international conference included renowned academicians, entrepreneurs, and professionals across the world. An important aspect of this international conference is that it has given enormous importance to women, which includes Conference Director, Conference Convener, Co-Conveners / Associate Conveners and maximum women academicians as Organizing Secretaries, Organizing Committee Members and Session Chairs respectively. Also, majority of the abstract authors, paper presenters and participants to ICCRESMA '2026 are women. This clearly indicates that National Foundation for Entrepreneurship Development (NFED), Coimbatore, Tamil Nadu, India has been empowering women at all spheres and regards them as the potential workforce for nation building and global socio-economic transformation.

There are three main tracks in this international conference namely Science, Engineering & Technology (SET), Management, Innovation & Entrepreneurship (MEI) and Arts & Humanities (AHU) respectively, which comprise of 47 streams under these tracks, which are indicated below:

1) Under the SET Track there are 25 streams, namely Computer Science & Engineering, Information Technology, Electrical & Electronics Engineering, Electronics & Communication Engineering, Civil Engineering, Automobile Engineering, Textile Technology, Design Studies, Energy Studies, Mathematics, Statistics, Physics, Chemistry, Computer Science, Computer Applications, Geology, Earth Sciences, Geophysics, Botany, Zoology, Microbiology, Biotechnology, Biochemistry, Pharmacology and Environmental Science, wherein it included 71 paper presentations.

2) Under the MEI Track there are 8 streams, namely Entrepreneurship Development, Organizational Behaviour, Human Resource Management, Finance, Marketing, Commerce, Economics and General Management, wherein it included 40 paper presentations.

3) Under the AHU Track there are 14 streams, namely Communication Studies, English Literature, General Education, Public Administration, Sociology, Social Work, General Law, Criminology, Victimology, Women's Studies, Psychology, Home Science, Special Education and History, wherein it included 24 paper presentations.

There are 135 paper presentation sessions, which have been scheduled and distributed across the aforesaid tracks, which are chaired and moderated by 20 session chairs from different states of India viz. Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Punjab, Chandigarh, Uttar Pradesh, Gujarat and Manipur. A total of 114 online paper presentations has been completed, covering 84.44 percent, which is one of the remarkable achievements of our three-day online International Conference (ICCRESMA '2026). The e-proceedings covered 80 abstract submissions.

A total of 220 participants registered in this international conference. The international keynote speakers and a participant included 7 countries (Nigeria, Malaysia, United Arab Emirates, United Kingdom, South Africa, Singapore & Israel). The national keynote speakers and participants of this international conference has covered 22 states (Tamil Nadu, Kerala, Andhra Pradesh, Telangana, Karnataka, Goa, Gujarat, Maharashtra, Rajasthan, Odisha, Madhya Pradesh, Uttar Pradesh, Chhattisgarh, Jharkhand, Punjab, Haryana, West Bengal, Assam, Meghalaya, Mizoram, Nagaland and Manipur) and 4 Union Territories (Puducherry, Delhi, Chandigarh and Jammu & Kashmir) out of 28 States and 8 Union Territories of India constituting 72.22 percent across its length and breadth.

The research presentations have provided adequate knowledge sharing and intellectual enrichment. The keynote address by various international and national speakers have highlighted the research innovations and upcoming challenges through addressing Community Development through Local Self-Governance, Ethical Polices & Implications for Generative AI, New Research Focus on Societal Harmony, Global Restructuring through Academia, Spoken Language in Classrooms, Holistic Innovation for Bridging Prosperity, Importance of Entrepreneurial Ecosystem, Sustainable Development for Global Prosperity, Sustainable Business Practices, Harmonizing Humanities in Higher Education through Musicality, Education 4.0 with AI, Mental Health & Well-being in Globalized Society, Medical Humanities Integration for Effective Clinical Practices, Holistic Approach for Innovative Research, Synergy of Industry and Academia in Research, Research-Driven Innovation for a Holistic Global Future, Sustainable Environment through Green Construction, Cybersecurity in the Age of AI, Importance of AI as Catalyst for Global Restructuring, Humanistic Ways & Beyond Law, Research Visibility & Recognition, Smart Agriculture Using Technology Innovation and Reshaping Industries & Societies through New Vistas in Research.

I am sure the scientific researches, technological innovations, management processes, artistic approaches, and humanistic views have provided better insights about the global happenings through this international conference (ICCRESMA '2026). Also, the research deliberations are truly intellectual and indispensable to global community for fostering sustenance and inclusive growth. This knowledge sharing platform paves the way for holistic global restructuring and transformation towards addressing various research innovation endeavours. Also, ICCRESMA 2026 has reinvigorated our research potential through updating knowledge transformation through righteous research contributions towards achieving socio-economic development and overall prosperity.

I extend my hearty congratulations to Dr. Ramya Kandavel, Conference Director & Patron, ICCRESMA '2026 and Executive Chairman & Director of NFED for her indomitable efforts in meticulously conducting and successfully hosting this three-day international conference to become a historical success.

I express my sincere thanks to Mr. Jaswin Kumar N. R., Technical Head and Youth Facilitator of NFED for his continuous support in organizing this virtual international conference.

I heartily wish all success to the conference convener, conference co-conveners, organizing secretaries, organizing committee members, international & national keynote speakers, session chairs, abstract authors, paper presenters and participants of this three-day international conference.

Thank You

Sd/-

KVM. Prof. Dr. R. Ganesan
Conference Chair & Chief Patron, ICCRESMA '2026
&
Founder Chairman & Presidium Chair, NFED

ICCRESMA 2026

29–31 January 2026

Paper Presentation Awards

Track 1: Science, Engineering & Technology (SET)

TR1-ICCRESMA2026-SET-44

Cellular Automata in Social Networks – A Comprehensive Overview
Dr. Biswanath Sethi & Ms. Prabhati Sethy

Track 2: Management, Entrepreneurship & Innovation (MEI)

TR2-ICCRESMA2026-MEI-14

Impact of Social Media Influence on Millennials' Investment Decisions – An Empirical Analysis on Mediating Role of Financial Literacy
Ms. Pavithra. C, Ms. Swetha Sarathy S & Ms. Sindhu. P

Track 3: Arts & Humanities (AHU)

TR3-ICCRESMA2026-AHU-22

Content Analysis on Portrayal of Police in Print Media through Newspaper
Ms. Sri Vardhani Gadipudi & Dr. Rufus D

Conference Paper Abstracts

Efficient Breast Cancer Detection Technique Using Deep Convolution Neural Network Model

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Abstract

Artificial Intelligence (AI) plays a vital role in the current scenario towards all kinds of application domain areas without human interventions. The advantage in using AI is that it solves the complex problem by using machine learning model with high level of accuracy. Moreover, AI models are classified into various types based on the features namely reactive machines, limited memory, mind theory and self-aware ability. Out of these models, Machine Learning Model gains significance by supporting the AI system through supervised learning, unsupervised learning and reinforcement learning. Also, it solves classification, clustering, regression-based problems with real-time data sets. The present research adopts this model, wherein it uses classification technique to detect the breast cancer as malignant and benign in early stages. The classifier provides high accurate results because it causes the severity of cancer to patients. The proposed model performs various phases namely image pre-processing, image segmentation, feature extraction & selection and classification. The images are collected from the sources and remove noise within it. The pre-processed images are then segmented using semantic and instance levels respectively. Semantic segmentation considers the whole image and gives minimum accuracy than instance level, so the hybrid model provides high level of accuracy. Pearson's correlation filter methods are used to select the features from mammogram images. The Breast Cancer Wisconsin (Diagnostic) data set is collected from the Kaggle to understand whether the cancer type is benign or malignant. The objective is to perform automatic feature selection and discover the relevant attributes related to tumors. The complex relationships are eliminated and to provide only the optimized features in this model, which provides high accuracy. Furthermore, it uses the U-Net architecture with Deep Convolution Neural Networks for identifying the exact location of the cancer cell within the body for facilitating the diagnosis and recommending the appropriate treatments.

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Enhancing Sleep Apnea Prediction Using Advanced Numerical Dataset Analysis – A Diagnostic Study

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Abstract

Sleep apnea significantly impacts human health, necessitating accurate and early detection systems. This study presents a mixed-model deep learning system that analyses polysomnographic data from the Sleep-EDF dataset using Convolutional Neural Networks (CNNs) and Bidirectional Long Short-Term Memory (BiLSTM) networks. This method effectively captures spatial and temporal interconnections in Electroencephalogram (EEG), Electrooculogram (EOG) and Electromyogram (EMG) recordings and achieves reliable performance measures. The system outperformed conventional models and previous frameworks by scoring an impressive 98.7 percent accuracy, 98.4 percent precision and 98.6 percent F1-score. In particular, robust classification capabilities of the system have been demonstrated through Area Under Curve-Receiver Operating Curve (AUC-ROC) values above 99 percent in the wake, Non- Rapid Eye Movement (NREM) and Rapid Eye Movement (REM) phases. Moreover, the statistical significance is verified using paired t-tests. The proposed method is scalable and applies to both academic and clinical contexts, as it manages the limitations of automated predictions of sleep apnea. Within the framework of healthcare, an area for improvement in the future is by adopting the implementation of real-time processing in healthcare systems.

Nanotechnology in Medical Field: Current Trends and Future Prospects

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Abstract

Nanotechnology has revolutionized modern medicine by offering remarkable advancements in medicines, tailored treatment plans and diagnostics. Targeted medication delivery, enhanced imaging and regenerative health care are just a few of its uses. However, there are possible hazards associated with these developments, necessitating a careful evaluation of the advantages and difficulties. The applications of nanotechnology in medicine have been quite significant in the recent years. Keeping this in view, the researcher examines on how nanotechnologies are employed in medical procedures, emphasizing its essential elements—such as nanoparticles, nanocarriers and nanosensors—which improves drug delivery, imaging methods and diagnostics. The study focuses on tailored healthcare and regenerative therapies alongside encompassing the currently existing targeted approaches towards cancer cure by adoption of nanotechnology for enhanced imaging techniques and sophisticated diagnostic instruments. Furthermore, the present research addresses on difficulties, moral dilemmas and changing regulatory environment around nanotechnology for medical applications.

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Experimental Study on Enhancing Landslide Modelling Using MATLAB for Safeguarding Guwahati City, Assam

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&
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Department of Electrical & Electronics Engineering
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Abstract

Landslide modeling serves as a vital tool for replicating and analyzing the incidence, movement and potential impacts of slope failures. By integrating geological, hydrological and climatic parameters with scientific, mathematical, and computational techniques the landslide modeling supports hazard assessment. Also, it enhances the understanding of landslide dynamics and contributes to the development of effective mitigation and early warning strategies. The proposed methodology adopts a systematic framework consisting of five major steps: defining problem parameters, developing slope geometry, assigning material properties, calculating the Factor of Safety (FOS) and visualizing the results. This structured approach enables a comprehensive evaluation of slope stability and provides insights, which are essential for urban planning and infrastructure development in landslide-prone regions particularly for the city of Guwahati, Assam. Moreover, the experimental findings showed that varying slope angles between 30° and 60° does not significantly influence landslide occurrence, as the FOS remains above 1.0 across all scenarios. This indicates that factors such as soil cohesion, saturation level and pore water pressure exert a more substantial impact on slope instability. The results further demonstrated that reduced cohesion, combined with increased saturation, leads to a marked decline in FOS, underscoring the importance of soil strength and moisture conditions. Additionally, the study emphasizes the potential of developing a Landslide Early Warning System (LEWS) using sensors that collect real-time data on rainfall, soil moisture, temperature, humidity, and ground movement. In furtherance, it alerts and safeguards the city by providing the information on possible occurrences of landslides at the specific areas.

Machine Learning Models for Speaker Gender Classification Using Acoustic Features – A Comparative Analysis

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&
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Abstract

This study presents a practical and reliable approach to identify a speaker's gender by analyzing the acoustic speech features of human speech. This study included 22,000 voice samples and prepared them by combining real recordings with synthetically generated data to get a balanced and diverse dataset. The similarity between two data types is confirmed through statistical validation using the Kolmogorov–Smirnov and T-tests. These tests established the synthetic samples accurately reflected the characteristics of real speech. The fundamental acoustic features: pitch, intensity and first two formant frequencies (F1 & F2) have been extracted using Praat software. This software is used to train machine learning models: Logistic Regression, K-Nearest Neighbors (KNN), Support Vector Machines (with linear and RBF kernel), Decision Tree, Naive Bayes and Multilayer Perceptron (MLP) neural network. The performances of these aforesaid models are measured using evaluation metrics such as accuracy, precision, recall and F1 score. It is to be noted that KNN model achieved the highest accuracy of 97.56 percent, which has been followed closely by the MLP model with 97.36 percent. The findings highlighted that lightweight interpretable models can give strong and consistent performance for gender classification without depending on complex computational models. The present study demonstrates the combination of basic acoustic speech features with simple machine learning models, which can give precise and efficient gender identification. Also, it makes the approach suitable for real-time and voice-assisted applications.

AI Driven Optimal Location of Battery Energy Storage System in Power Grids for Powering Future Sustainable Energy Infrastructure

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Abstract

The rise in infiltration of renewable energy sources (RES) has brought about variability, uncertainty and instability in current power grids, which have sought advanced answers in controlling voltage, minimizing loss and improving reliability of the systems. Battery Energy Storage System (BESS) can be a promising solution to these difficulties though they have to be correctly placed and sized to provide a significant effect. The present study provides artificial intelligence-based optimization algorithm to use in allocating optimal sites and capacities of BESS units to the IEEE-33 bus (transmission-level) and IEEE-69 bus (distribution-level) test systems. This research combines predictive machine-learning models like Random Forests and LSTM networks with metaheuristic algorithms like PSO, GA in ensuring a higher degree of accuracy and efficiency of BESS allocation in various load and renewable variability conditions. The MATLAB / Simulink, MAT power and Python have been used to conduct the power-flow analysis, model predict using AI / ML and test the efficacy of optimized solutions. The results are compared in terms of simulations across scenarios, namely: no BESS, single BESS and multiple BESS units to assess changes in the areas of voltage stability, power-loss reduction, cost saved in operation and utilization of renewable energy sources. Moreover, it is estimated that the weak-bus voltage deviations will decrease significantly. Thus, the study enriches powerful AI-based grid planning decision tool of smart, resilient and sustainable energy infrastructure for powering the future needs.

Music Mood Recommender through Facial Emotion Recognition and Sentiment Analysis Application – A Diagnostic Study

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&
Ms. Harshita Pathak
Student*
&
Mr. Pranav Arora
Student*
&
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Abstract

In recent years, the integration of artificial intelligence and effective computing has opened new possibilities for personalized user experiences in every domain. The present study proposes a comparative analysis of two deep learning architectures, ResNet-50 and Xception for facial emotion recognition in FER-2013 dataset. Moreover, the study presents an intelligent music recommendation system designed to recommend music based on the real-time emotional state of user. The aforesaid architectures have been evaluated in terms of accuracy and computational efficiency, whereas it has been observed that achieving the accuracies of 85.70 percent and 70 percent respectively. Based on these results, ResNet-50 has been selected for deployment in the web application due to its higher accuracy and balanced performance. The application enables users to either upload or capture an image upon which the system detects facial emotions and recommends mood-specific playlists. Additionally, a text-based sentiment analysis module using BERT model has been developed and integrated in this application to analyze the user-provided textual input thereby allowing users to receive music recommendations aligned with both facial and textual sentiments. The test accuracy achieved while implementing BERT is found to be 65.30 percent. Furthermore, this research work demonstrates the potential of combining computer vision (CV) and natural language processing (NLP) to enhance human–computer interaction and create personalized entertainment experiences.

Magnetic Investigations for Structural Controls on Groundwater Contamination and Pollution Pathways along Musi River, Telangana, India – A Diagnostic Study

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Abstract

Musi river is flowing from Perzadhiguda to Valigonda in Telangana, India, which is one of the major drinking water sources for Hyderabad city. Therefore, the pollution levels alongside groundwater contamination needs to undergo a constant check for the eco-system. The study intended to understand the ground water contamination and pollution pathway of the river. In furtherance, magnetic investigations have been conducted along its pathway to delineate subsurface structural features controlling groundwater contamination and pollutant transport. A total of 1,260 magnetic measurements were recorded along twelve east–west traverses on northern and southern banks of the river with station intervals of 100 m and traverse spacing of 500 m. Qualitative analysis of total magnetic intensity (TMI), magnetic anomaly, reduction-to-pole (RTP) and analytical signal maps identified faults, shear zones, dyke intrusions and lineaments. Magnetic highs correspond to intrusive bodies, while lows align with river channels. Steep magnetic gradients and bipolar anomalies revealed the tectonically disturbed zones, which are further corroborated by analytical signal maps. Quantitative analysis using the radial average power spectrum (RAPS) method estimated depths of magnetic sources, revealing three subsurface layers with thicknesses ranging from 0.309–1.592 km (first layer), 0.232–0.8 km (second layer) and 0.100–0.3 km (third layer) across five study segments. The segment-wise analysis indicated clustering of structural heterogeneities in the northern, central and southern parts of the study area. Moreover, the integration of qualitative and quantitative results has demonstrated the intersecting lineaments, faults and fractures that are spatially coincident with the zones of groundwater contamination. Thus, suggesting structural features that are within the Peninsular Gneissic Complex (PGC) act as conduits for pollutant migration. This study highlighted the significance of magnetic methods in environmental geophysics and provides a robust framework for groundwater management and pollution mitigation in urbanizing river basins.

Performance of Multilevel Inverters in Electric Vehicle Power Systems

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Abstract

The rapid growth of electric vehicles (EVs) has increased the demand for efficient, reliable and high-performance power electronic converters. Multilevel Inverters (MLIs) have emerged as a promising solution for EV applications due to their ability to produce high-quality output voltage with reduced harmonic distortion, lower switching losses and improved efficiency. This study presents an overview of various multilevel inverter topologies—such as diode-clamped, flying-capacitor, and cascaded H-bridge inverters—and discusses their suitability for electric vehicle traction systems and onboard power electronics. The key performance aspects including power quality, efficiency, voltage stress reduction and thermal performance are analyzed. Additionally, recent advancements in control strategies and modulation techniques for MLIs in EV applications are highlighted. The researcher concluded that multilevel inverters play a crucial role in enhancing the performance, reliability and energy efficiency of modern electric vehicles.

Design of Carbon Capture and Utilization (CCU) Module for Heavy Commercial Vehicles

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Abstract

Generally, heavy vehicles are responsible for more than a quarter of greenhouse gas (CO_2) in the world emission level (IEA). Transport-related CO_2 emissions from developing countries will contribute significantly in increasing the proportion to global CO_2 emissions unless fast mitigating measures are implemented. The present study describes design of carbon capture and Utilization module to mitigate greenhouse gas concentrations from commercial vehicles. The CCU consists of three stages: capture, transport and utilize. The post combustion CO_2 capturing technique has been chosen, which separates it from exhaust gas. The module has layers of membranes to capture carbon and also more surface area is provided for effective absorption from exhaust gas. The processing unit has been developed with a polyvinyl chloride sheet to prevent exposure to outside environment. Furthermore, in the presence of water two electrodes have been deployed for the conversion of carbon dioxide to formic acid. This study has been conducted in dense traffic regions and also in closed rooms, which produced higher volume of CO_2 and come out with amicable solutions to control the emission levels. Every litre of carbon dioxide (CO_2) taken as an inlet, which yields 470 milliliters of formic acid at the voltage differences 4.0 - 4.2 Volts between electrodes in this experiment.

Natural Bioactives and its Expanding Role in Modern Medical Science

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&
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&
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Abstract

Natural bioactives—phytochemicals, alkaloids, terpenoids and polyphenols derived from plants, microbes and marine organisms—represents a cornerstone of contemporary medical innovation. These compounds evolved over millennia, which offer multifaceted therapeutic potential, addressing the limitations of synthetic drugs such as resistance, toxicity and side effects. Recent advances in metabolomics, high-throughput screening and computational modelling have accelerated their discovery and validation, transforming traditional herbal remedies into evidence-based therapeutics. The prominent examples include artemisinin from *Artemisia annua*, revolutionizing malaria treatment; curcumin from turmeric, exhibiting anti-inflammatory and anticancer properties via NF-κB pathway modulation; and paclitaxel from Pacific yew bark, a frontline chemotherapeutic for breast and ovarian cancers. These bioactives target diverse pathways, including apoptosis induction, oxidative stress mitigation and microbiome modulation, underpinning their efficacy in chronic diseases like diabetes, neurodegeneration and cardiovascular disorders. The expanding role of natural bioactives extends to precision medicine, whereas nanotechnology enhances bioavailability. For instance, liposomal formulations of quercetin—and AI-driven platforms predict synergistic combinations with conventional drugs. In furtherance clinical trials underscore their promise: resveratrol analogues showed cardiovascular benefits, while microbial-derived statins rival synthetic versions in lipid management. However, challenges do persist, including standardization, scalability and regulatory hurdles, yet sustainable sourcing via biotechnology (example: plant cell cultures) mitigates these aspects. As global health faces antimicrobial resistance and pandemics, natural bioactives herald a paradigm shift towards holistic and resilient medical science. Moreover, integrating them with pharmacogenomics will redefine treatment landscapes, fostering personalized and eco-friendly therapies for 21st century.

Emerging Trends and Challenges in Cryptography and Network Security: A Comprehensive Review

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Abstract

Today, in the quickly advancing digital age, significance of cryptography and network security cannot be underestimated in protecting information, communication networks and vital infrastructure. The exponential rise of internet, cloud computing phenomenon, Internet of Things (IoT), mobile communication devices and digital payment services has increased the amount of confidential data being communicated over the networks. The current research delves into latest developments, emerging approaches and existing challenges in the field of information security. The present research emphasizes on evolving trends in the field of cryptography, ranging from post-quantum cryptography, lightweight cryptography, homomorphic encryption, security techniques using blockchain and zero-trust frameworks. Post-quantum cryptography has emerged as a popular area because of the looming threat of quantum computing to the current public key cryptosystems, including RSA and ECC cryptography. Lightweight cryptography has evolved as a response to the cryptographic needs of resource-limited environments, especially IoTs and embedded systems. Homomorphic encryption has enabled the processing of encrypted data thereby improving the privacy of cloud computing services in a significant manner. Paralleling developments made in cryptography, this study also covers recent developments in network-level security such as AI and machine learning approaches to intrusion detection systems, software-defined networking, network function virtualization and secure environments of 5G and Edge Computing. AI-assisted solutions enhance real-time processing and response to threats by investigating immense patterns of network traffic. SDN and NFV provide malleability and a centralized approach to manage dynamic enforcement of security policy. The deployment of environments related to 5G and Edge Computing has reshaped network designs, which requires effective measures to deal with these new vulnerability exposures. Despite such progress, the report points out some key challenges that cryptography and network security industry faces today. This includes rising number of cyberattacks like ransomware attacks, phishing attacks and advanced persistent threats (APTs), wherein key manageability issues, scalability issues, performance overheads, interoperability issues and compliance & regulatory issues play a vital role. The entire study is based on secondary literature and available case studies, wherein a comprehensive review has been conducted and explained accordingly. The study draws upon latest trends and attempts to provide insightful information and approaches to researchers, academicians and professionals for better understanding of the current issues. The results point out the need for resilient and future-proof models and approaches for ensuring the latest threats are met with adequate future-ready measures. Ultimately, the broader takeaway is the need for innovation and proactive approaches in addressing the future challenges of network security and cryptography.

Impact of Environmental Factors on Reduction of Efficiency in PV Modules

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Abstract

Photovoltaic (PV) modules have seen normally used as one of the most effective solutions to meet the energy demand in the recent years. However, in comparison with other generation technologies, it faces different challenges specially in industrial areas and harsh environmental conditions. This research study investigates the impact of dust in normal natural conditions in photovoltaic panels. Also, it included PV modules of two different technologies (Mono-Si and Poly-Si), three different tilt angles (30°, 45° & 50°) and four different surface conditions (clean and soiled) for their experiments. The research has been conducted over a period of one month in an industrial city on the campus of Girijananda Chowdhury University, Azara, Assam. The main findings indicated that Cement plays the worst element, which reduces maximum power with 36 percent in 45° tilt condition and 26 percent at 0° tilt condition under no shading condition. Under partial shading condition, Sand has the highest power loss with 67 percent at 0° tilt condition and Red Soil shows the lowest with 6 percent power loss. The mono-Si module outperformed the poly-Si module by 17 percent on average for both clean and soiled modules. The overall average power losses for both mono-Si and poly-Si modules have been lowered by around 32 percent when installed at the 30° tilt angle. The study of dust particles' morphology and chemical compositions along with collected environmental data has confirmed that the dust-induced shade effect could contribute to soiling impact on PV modules.

Surface Water Dynamics Assessment and Mapping Using Spectral Indices in Anantapur City at Andhra Pradesh

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Abstract

Surface water resources in semi-arid urban regions are highly sensitive to climatic variability and anthropogenic pressures. This study presents a comprehensive assessment of surface water dynamics in Anantapur City, Andhra Pradesh, India using multi-temporal remote sensing and rainfall analysis over a 20-year period (2000–2020). The Modified Normalized Difference Water Index (MNDWI) derived from Landsat imagery is employed to delineate and quantify surface water bodies, while long-term rainfall data have been analyzed to understand hydro-climatic influences on surface water availability. Temporal analysis has revealed significant interannual and seasonal fluctuations in surface water extent, which is closely linked to rainfall variability. The total surface water area exhibited a declining trend during prolonged dry phases particularly between 2001–2005 and 2015–2018, with reductions of up to 35-40 percent compared to above-normal rainfall years. Conversely, episodic recovery in surface water extent was observed during high rainfall years, notably in 2007, 2010 and 2013. A strong positive correlation is identified between annual rainfall and MNDWI-derived surface water area, indicating rainfall as the dominant controlling factor. Accuracy assessment conducted using high-resolution Google Earth imagery and field-based reference points yielded an overall classification accuracy of 88 percent and a Kappa coefficient of 0.85 confirming the reliability of the extracted surface water features. The results highlighted increasing vulnerability of surface water resources due to erratic rainfall patterns and urban expansion. This study demonstrated the effectiveness of spectral indices integrated with rainfall data for monitoring surface water dynamics in data-scarce semi-arid regions. The findings provided valuable inputs for urban water resource planning, drought preparedness and sustainable surface water management in Anantapur City.

Spectral Analysis of Sea Surface Temperature Over Midlatitude Region – A Climatological Approach

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Abstract

Sea Surface Temperature (SST) refers to increase in the temperature of the ocean's surface waters, typically driven by global warming and climate change. SST is a major factor in controlling the climate and its fluctuations. SST variations offer a potential source for forecasting seasonal and long-term climate changes. In this study, SST data from Climate Reanalyser—a platform for visualizing climate and weather models—are used to extract daily SST values for 60°S-60°N and 0-360°E regions from 1982 to 2023. Daily SST has converted into monthly means for each year and grouped into five segments. Spectral analysis of mean SST deviation showed strong atmospheric oscillations, including intraseasonal oscillations (ISO), annual oscillations (AnO) and quasi-biennial oscillations (QBO) with varying amplitudes. ISO, AnO and QBO appeared in 1982-1989, 1990-1999 and 2000-2009 with AnO having the largest amplitude. ISO, AnO and QBO have been highly prevalent between 2010 and 2019 with ISO showing greatest amplitude. Only ISO and AnO have been found from 2020 to 2023 with ISO having highest amplitude. The study showed that exchange of heat, momentum and moisture between the atmosphere and oceans influences atmospheric oscillations. Moreover, the changes in SST significantly impact the temperature and circulation patterns of atmospheric layers. This study helped to understand the connection between SST and atmospheric oscillations.

Delineation of Water Contamination Zones Using Geospatial Techniques around Inactive Mining Areas at South West Part of Cuddapah Basin at Andhra Pradesh

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Abstract

Groundwater pollution undermines sustainable development by threatening water security, human health and ecosystems thereby impeding progress toward key UN Sustainable Development Goals (SDG 3,6 & 15). It is a serious concern, particularly in semi-arid regions like South West part of Cuddapah Basin, Y.S.R Kadapa District at Andhra Pradesh. Traditional methods for identifying pollution-prone areas are often time-consuming, costly and less effective. This study adopts geospatial approaches for better understanding and identifying regions where contaminated water may accumulate and spread within aquifers in the zone of Inactive Mining areas. These methods are useful in detecting low-lying areas, wherein water is likely to stagnate and become polluted. By applying these advanced tools, it is possible to analyze key factors such as land use, soil types, elevation and anthropogenic activities. Moreover, combining these techniques provide a comprehensive understanding of areas at risk of both surface and groundwater contamination. The resulting contamination risk maps will support more effective planning and sustainable management of water resources. This study will contribute to the development of a replicable methodology for sustainable aquifer protection in vulnerable regions.

Evaluation of Natural Substrates and Seed Coating Methods for Enhancing Radish Seed Performance

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Abstract

Seed coating is an important and widely adopted technique in modern agriculture as it provides a protective and functional layer around seeds to improve their handling, enhance germination and promote uniform crop establishment. The present study investigates on effects of various natural substrates and seed coating techniques on the germination and early growth of radish (*Raphanus sativus*) seeds with a focus on sustainable and eco-friendly inputs. A series of experiments have been conducted using natural coating materials including cowdung ash, banana peel powder, used tea powder, coconut coir powder and mushroom compost, wherein each combined with neem leaf extract. These materials are applied using different coating methods such as seed encrusting, seed dressing, film coating, seed pelleting and seed bombing techniques respectively. Germination and seedling vigour are assessed through both *in vitro* paper towel assays and *in vivo* soil-based methods to ensure a comprehensive evaluation. The results revealed notable variations in germination percentage and seedling vigour among different treatments. Also, among all substrates tested, coconut coir powder exhibited superior performance, particularly when applied through seed dressing method. This treatment resulted in higher germination rates and significantly enhanced root and shoot development, indicating improved early seedling establishment. Overall, seed dressing emerged as the most effective coating technique, contributing to increased seedling vigour and healthier early growth stages. The findings of this study highlighted the potential of natural, biodegradable substrates in seed coating applications and underscore their role in enhancing agricultural productivity while supporting sustainable farming practices.

Prevalence of Micronutrient Imbalances and Pathological Markers of Anemia in Adolescents Causing Silent Strain – A Diagnostic Study

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Abstract

The area of under-nutrition of adolescents (10-17 age-group) in developing countries has been badly neglected, wherein adolescent girls, young women and future mothers represent a crucial phase of growth. Iron deficiency anemia among adolescents in India are highly prevalent and seemingly a public health problem. Moreover, in India anemia among adolescent girls reported to be around 60 to 70 percent the highest among developing countries. In furtherance micronutrients and various pathological parameters like MCV directly linked to various types anemia like Microcytic, Macrocytic, Normocytic and Normochromic, which may also indicate Iron deficiency anemia. This study aims to identify the prevalence and associated factors for adolescent anemia. A cross-sectional analytical study has been conducted from December 2022 to February 2023 after obtaining approval from the Central Ethics Committee. The sample size of 250 has been included based on previous studies conducted in rural Karnataka, which has reported a prevalence of anemia as 20.7 percent prevalence of anemia among adolescents, considering an absolute error of 5 percent with 95 percent confidence. Laboratory investigations have been carried out to assess various micronutrients and pathological indicators. Also, the present study, prevalence of anemia is 17.46 percent and among adolescent girls it has been indicated as 21.9 percent in comparison to boys, which is 13.18 percent. Macrocytic anemia accounts for 18.2 percent, normocytic anemia is 13.2 percent and among adolescent's 68.2 percent of the adolescents had hemoglobin level less than normal. The average Hemoglobin Levels are significantly lower in anemia group compared to normal subjects. Other pathological indicators like RBC, PCV, MCV, MCH and MCHC average levels are significantly reduced in anemia group compared to no anemia group indicating iron deficiency anemia among adolescents. Interestingly, 83 percent of the adolescents had normal Hematocrit levels of which 82.7 percent of girls had normal levels Hematocrit compared to boys, which has been found to be 80.3 percent. Also, 6.4 percent of adolescents have lower Hematocrit values indicating anemia or they have less oxygen carrying capability in the blood. The micronutrient imbalances and pathological markers of anemia in adolescents highlighted anemia as a largely underestimated yet critical public health challenge during a pivotalstage of growth and development. This 'silent strain' can impair physical growth, cognitive performance, immunity and long-term health outcomes. Therefore, early screening, comprehensive nutritional assessment and targeted, multi-micronutrient interventions—supported by education and public health policies—are essential to break the cycle of hidden deficiency and safeguard adolescent well-being.

Reimagining Wireless Mesh Sensor Networks for the 6G Era: Intelligent Architectures, Sustainable Design and Secure Interoperability

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Abstract

These days, Wireless Mesh Sensor Networks (WMSNs) are quite essential for offering modern Internet of Things (IoT) applications scalable, reliable and low-power communication infrastructures. New technologies like 6G terahertz (THz) communication, edge artificial intelligence (Edge AI), federated learning, block chain-based security and interoperability protocols like Matter, Thread and Wi-SUN, which have contributed to the rapid expansion of WMSNs over the past decade. With a focus on their development into intelligent, safe and environmental-friendly mesh-based systems, this study provides a thorough and up-to-date overview of WMSN advancements till 2025. For adaptive mesh networks, the researchers intended to investigate the combination of zero-trust security models, decentralized edge-AI-based decision-making and energy-harvesting battery-free sensing. Particular attention is paid to current research avenues in autonomous mobility, health monitoring, disaster recovery, smart homes and precision farming. Furthermore, this research study identifies open issues that need to be resolved for practical implementation, describes significant research gaps such as AI-based topology adaptation and secure over-the-air updates and classifies the state-of-the-art along technological layers. Moreover, the results of this study will be useful for researchers and practitioners wishing to build or compare next-generation WMSNs in line with 6G goals, ubiquitous intelligence and green IoT ecosystems.

Locally Uniform Spaces in the L-TOP Category: A Quasi-Coincident Approach

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Abstract

In the year 2010, Mitra and Hazarika developed the notion of L-locally uniform spaces in the L-TOP category as a generalization of Hutton's uniformity. Many interesting and useful results on compactness, completeness and metrizability are then studied. However, the neighbourhood systems introduced by these spaces do not necessarily satisfy the multiple-choice principle. Keeping these aforesaid aspects in view, this research study introduces the notion of locally uniform spaces in the collection of lattice-valued of lattice variable functions satisfying supremum-preserving and every lattice point is quasi-coincident with its corresponding functional value. The induced neighbourhood system is then shown as a quasi-coincident neighbourhood system thereby satisfies the multiple-choice principle. Also, interior and closure operators are then introduced in order to establish that every locally uniform space generates a Chang's topological space. The present study found that local uniform continuity implies continuous using quasi-coincident approach. Furthermore, the results have shown that the generating topology is regular.

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Seasonal Impact on Hematological and Inflammatory Stress Markers in Sonali Chickens Reared Under Rural Conditions – A Diagnostic Study

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Abstract

Environmental and climatic variations exert a considerable influence on health, immune status and productivity of poultry species. The Sonali breed has been developed through crossbreeding Rhode Island Red and Fayoumi, which is recognized for its adaptability and resilience under rural production systems. The present study has been carried out to evaluate the effect of seasonal variations on hematological and biochemical stress indicators, specifically interleukin-6 (IL-6), C-reactive protein (CRP) and cortisol in Sonali poultry during humid and dry winter seasons in the rural regions of Chhattisgarh. A total of 48 healthy Sonali birds, aged 55 days have been randomly selected and equally divided based on sex for both seasons. The blood samples are collected aseptically using heparin, EDTA and clot activator tubes. Serum obtained from clot activator tubes is utilized for biochemical analysis. Hematological parameters such as blood glucose, hemoglobin, packed cell volume (PCV) and heterophil-lymphocyte ratio (HLR) are estimated, while IL-6, CRP and cortisol have been analyzed using ELISA and immunoassay kits. The collected data are subjected to statistical analysis to evaluate seasonal and sex-wise variations among studied parameters. A significant variation ($P < 0.05$) in PCV values has been recorded between humid and dry winter seasons,

with males exhibiting higher PCV than females. IL-6 and CRP concentrations are markedly increased during humid winter in sexes, indicating pronounced inflammatory and immune responses under humid and thermally stressful conditions. In contrast, these parameters declined during dry winter, reflecting reduced physiological stress. Cortisol values did not differ significantly ($P > 0.05$) between seasons or sexes, signifying stable endocrine responses. HLR exhibited a similar trend to IL-6 and CRP, confirming its reliability as a stress biomarker. Females showed slightly higher IL-6, CRP and HLR levels in the humid season, suggesting greater immune reactivity. The findings indicated that Sonali breed exhibits effective physiological and endocrine adaptation to seasonal environmental changes in Chhattisgarh. Elevated IL-6 and CRP levels during the humid winter reflect transient immune activation, whereas stable cortisol concentrations demonstrate efficient stress tolerance. Thus, Sonali bird is well suited for rural poultry production with minimal management inputs, confirming its resilience and adaptability under fluctuating climatic conditions.

Patient Clustering on Similar Symptoms Using K-Means Algorithm

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Abstract

Healthcare organizations collect a large amount of patient data every day. This data includes information about patient symptoms, age and medical history. Analyzing this data manually is quite difficult and time-consuming. In this context, patient clustering helps to group patients who have similar symptoms. This makes medical analysis easier and more effective. The present study used K-Means algorithm to cluster patients based on similar symptoms. The reason being, K-Means is a simple and popular clustering technique, which divides patients into different groups by measuring similarity among their symptoms. The main aim of this study is to understand how K-Means can be used in healthcare data analysis. The proposed approach helps doctors and healthcare staff to identify patient groups easily. Also, it supports better decision-making and treatment planning. Furthermore, results showed that K-Means is useful for basic patient clustering tasks and highlighted the importance of data mining techniques in healthcare applications.

Energy Emissions of Maharashtra State Textile Industries – Quantitative Assessment of Technology, Environmental Impact & Mitigation Measures

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Abstract

The textile industry is among the most energy-intensive manufacturing sectors in India, wherein Maharashtra as one of the prominent States has been contributing significantly due to its large concentration of spinning, weaving, processing and garment manufacturing units. The study presents a quantitative assessment of energy emissions from textile industries in Maharashtra, focusing on textile engineering technologies, environmental impacts and mitigation measures in line with prevailing energy-related acts, rules and policies. The sector's average energy intensity ranges from 2.5-4.5 kWh/kg of fabric for spinning and weaving, while wet processing consumes 35-60 MJ/kg of processed textile, accounting for nearly 55-65 percent of total industrial energy consumption. Fossil-fuel-based thermal energy contributes approximately 70-80 percent of total CO_2 emissions, with specific emissions estimated at 1.8-2.6 kg CO_2/kg of finished fabric in conventional processing units. The regulatory framework governing energy use and emissions has been analyzed, including Energy Conservation Act (2001), Bureau of Energy Efficiency (BEE) norms, Perform, Achieve and Trade (PAT) scheme and Maharashtra State renewable and energy efficiency policies. The quantitative evaluation of mitigation strategies indicated that adoption of energy-efficient motors and drives can reduce electrical energy consumption by 15-25 percent, while waste heat recovery systems in boilers and stenters offer 10-20 percent thermal energy savings. Integration of renewable energy sources, such as rooftop solar and biomass boilers has the potential to offset 20-30 percent of grid electricity demand, leading to an overall 25-35 percent reduction in greenhouse gas emissions. The study demonstrated that technology-driven interventions supported by policy compliance can significantly enhance energy performance and reduce the carbon footprint of textile industries in Maharashtra.

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Fabrication of Biodegradable Pot with Agricultural Waste

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Abstract

Biodegradable pots offer an eco-friendly alternative to plastic containers in agriculture and gardening. Today, biodegradable pot is gaining importance because it has been developed using agricultural waste materials such as rice husk, corn husk, cocopeat, coconut coir, cow dung, neem powder, potato starch and corn starch. The mixtures have been moulded, oven-dried and coated with Murungai Pisin (drumstick tree resin) to improve strength and water resistance. In furtherance, crack repairs are performed using a rice husk–cow dung–starch paste. Moreover, these biodegradable pots have been tested with tomato and coriander seedlings under soil conditions and compared with plastic pots. The results indicated that good mechanical stability, healthy plant growth and gradual decomposition thereby demonstrating their potential for sustainable cultivation.

Design and Fabrication of Vertical Axis Wind Turbine

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Abstract

The increasing emphasis on sustainable and decentralized energy systems has led to growing interest in wind energy technologies suitable for low and variable wind conditions. Based on insights gained from prior studies and current research trends, this study focuses to identify the limitations of conventional horizontal axis wind turbines in urban and turbulent wind environments, thereby establishing the relevance of Vertical Axis Wind Turbines (VAWTs). The primary intent of this research is to design and fabricate a compact VAWT capable of harnessing wind energy from multiple directions while maintaining structural simplicity and operational reliability. The adopted methodology follows an experimental and design-oriented approach involves conceptual design, component selection, fabrication and functional evaluation of the turbine system. The developed model consists of a vertically mounted rotor, bearing-supported shaft, mechanical speed enhancement mechanism and an electrical conversion unit incorporating a DC generator, battery storage and inverter system. Observations from the fabricated prototype indicated that VAWT can generate usable electrical output at relatively low wind speeds and operate effectively under variable wind directions. The findings highlighted the feasibility, cost-effectiveness and adaptability of the proposed system for small-scale and off-grid applications, particularly in remote, energy-deficient and emergency-use scenarios. The study demonstrated that VAWTs can serve as a practical alternative to conventional wind energy systems in decentralized power generation.

Machine Learning in Menopause Studies – A Comprehensive Review

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Abstract

Menopause is a natural process that involves both physiological and psychological transitions in the female body, leading to permanent end of menstrual cycles. This often give rise to various health issues like heart disease, hot flashes, osteoporosis and weight gain, which need effective concern. In recent years, technological advances like machine learning (ML) have revolutionized the healthcare sector by supporting predictions, classification and decision-making tasks. This review examines the interactivity of menopause with machine learning (ML), highlighting the comprehensive analysis of applications, current trends and challenges. This study presents year-wise trend-based analysis of the number of publications across major publishers and indexing platforms from 2020 to 2025, showing valuable growth in research about menopause. The present study highlighted that this field is still at a nascent stage through a comprehensive review, which also identifies the niche areas that needs to be focused. Also, by synthesizing various trends, this review serves as a reference for future researchers exploring the blend of menopause and machine learning. This intersection is capable of transforming the women's health research area by exploring the complex challenges that are difficult to manage using a traditional approach.

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Effect of Deep Eutectic Solvents on Reducing Sugar Yields from Pine Needle Biomass

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Abstract

Pine needles (PNB), a lignocellulosic biomass has been pretreated with deep eutectic solvents (DES) at an optimized molar ratio of 1:2 with different organic acids viz. oxalic acid (OA), citric acid (CA), maleic acid (MA) and succinic acid (SA) in the presence of choline chloride. The OVAT approach has been applied for studying the effect of molar ratio (1:1 to 1:5) under the following conditions: biomass loading 10 percent, incubation temperature 90 °C and time period 3 hours. The pretreatment of PNB (10 percent) with DES at molar ratio of 1:2 in the presence of SA provided the highest (15.8 g/L) in total reducing sugar (TRS) yield, followed by OA (6.8 g/L) under conditions specified above. Response Surface Methodology (RSM) studies for enhancing TRS yields involved optimization of following parameters, temperature: 50 to 80°C, biomass loading: 5-10 percent and time period: 2-6 hours. The maximum TRS (23.5 g/L) is attained with DES molar ratio of 1:2 for OA under the conditions specified as, temperature: 61.76 °C, biomass loading: 8.65 percent and time period 3.84 hours. Molar ratio of 1:2 in case of SA with temperature: 45.4 °C, biomass loading: 5 percent and time period: 4.8 hours gave TRS yields of 15.2 g/L. Furthermore, highest (23.4g/l) -=TRS yield has been found in accordance with predicted value (23.5 g/L) in the case of OA, wherein molar ratio is 1:2. This study has validated the effects of eutectic solvents in reducing sugar yields using pine needle biomass.

Morphological and Molecular Identification of Red Pigment Producing Fungus from Soil at Kalyan City, Maharashtra

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Abstract

The overuse and harmful effects of synthetic dye have now urged the demand for natural colours. Plants, animals and microbes are the alternatives for production of natural pigments. The pigment production from both plants and animals has a limitation, low growth rate and large area is required for growth. Hence, microbes can be used to overcome this limitation. The present study focused on pigment producing fungi, which are isolated from soil samples that are collected from Kalyan City in Thane District at Maharashtra. Out of 33 colonies obtained onsterile Malt Extract Agar (MEA) plates, only three colonies showed pigment production after seven days. Based on morphological characters they have been identified as *Penicillium sp*. (green pigment), *Aspergillus s*p. (brown pigment), *Talaromyces sp*. (Red Pigment). Furthermore, red pigment producing *Talaromyces sp.* has been taken for molecular characterization with the help of ITS (Internal transcribes spacer region) sequencing and identified as *Talaromyces purpureogenus*. The nucleotide sequence is deposited in the GenBank, USA and an accession number was obtained as MT003977.1. The red pigment from this fungus can be an eco-friendly, organic colourant, which can be a substitute to the chemical colours used in various industries.

Cellular Automata in Social Networks – A Comprehensive Overview

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Abstract

The Cellular Automata (CAs) are spatially-extended dynamical systems, which evolve in discrete time and space. They have been extensively studied as models of physical systems and as models of massively parallel computing devices. The concept of Cellular Automata (CAs) is originally introduced by John von Neumann in his study of self-reproducing organisms. It consists of an array of identical cells and a local transition rule, which are simple discrete dynamical systems that exhibit fascinating complex patterns. During the evolution of CAs all cells follow the same rule to generate it to next state. Now-a-days social networking is an important online platform that is used by people to build social networks or social relations with others. Social networks usually serve as critical medium for information transmission, diffusion of epidemics and spread of behavior through sharing activities or similarities between individuals. Furthermore, researchers are currently working on varieties of challenges in social networking services and Cas. These aforesaid aspects have captured the attention of researchers to conduct a study focusing on a comprehensive review of CAs in social networks. In furtherance, this research has analysed the growth of virtual social network based on three different factors (selfishness, reciprocity and altruism). Also, provides better understanding of CAs importance and its applications in various issues of social networking.

Early Heart Disease Prediction Through Limited and Imbalanced Clinical Data – A Framework Using Data Efficient Machine Learning

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Abstract

Heart disease remains as one of the leading causes of mortality worldwide. Therefore, making early and accurate prediction is quite essential for effective clinical intervention. Although machine learning techniques have shown promising results in heart disease prediction, their performance heavily depends on the availability of large, balanced and clean datasets—conditions that are rarely satisfied in real-world clinical environments. Most clinical datasets are limited in size and exhibited significant class imbalance, leading to biased predictions and poor generalization. Hence, to address these challenges, this research study intended to provide a data efficient machine learning framework for early heart disease prediction under limited and imbalanced clinical data conditions. The proposed framework integrates effective data preprocessing, feature engineering and advanced imbalance-handling techniques, including synthetic oversampling and cost-sensitive learning to enhance predictive performance. Multiple machine learning models, including tree-based and ensemble methods have been evaluated and compared using clinically relevant metrics such as Recall, F1-Score and Precision Recall-Area Under the Curve (PR-AUC). The experiments conducted on benchmark heart disease datasets have demonstrated that the proposed framework significantly improves the minority-class detection and overall model reliability compared to conventional methods. Moreover, results highlighted the importance of data efficient learning strategies for developing robust and clinically applicable heart disease prediction models, especially in low-resource healthcare settings.

AHP Based Flood Susceptibility Modelling Progress in India Under Uncertainty Parameter During 2020-2025 – A Holistic Review

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Abstract

Flood susceptibility modelling is a crucial technique for identifying flood-prone locations and supporting effective disaster risk management and planning. In recent years, the Analytic Hierarchy Process (AHP) has gained widespread acceptance as multi-criteria decision-making technique for flood susceptibility assessment due to organized framework and ability to incorporate a number of environmental elements. This study provides a critical analysis of AHP-based flood susceptibility research conducted in India, which have been published between 2020 and 2025. The studied literature has demonstrated notable developments in the integration of AHP with Geographic Information Systems (GIS) for spatial analysis, incorporating substantial hydrological, topographical, geological and land-use characteristics. Recent advancements in criterion selection techniques, validation processes and comparative analyses with other decision-support models have improved the accuracy and dependability of flood susceptibility mapping. Despite these methodological improvements, conventional AHP is still constrained by intrinsic limitations, such as subjectivity in expert opinion, sensitivity to pairwise comparison matrices and limited capacity to manage uncertainty and vagueness associated with complex natural processes. These limitations may have an effect on the robustness and dependability of flood susceptibility results. Several researches have looked into sensitivity analysis, hybrid modelling methodologies and uncertainty-handling techniques to address these issues; nonetheless, a comprehensive and widely accepted answer has not yet been discovered. This holistic review outlines recent methodological advancements, critically examines fundamental sources of uncertainty and identifies substantial research needs in AHP-based flood susceptibility modelling. Also, it emphasizes on the growing need for fuzzy and hybrid multi-criteria frameworks to enhance model dependability and enable better decision-making in flood risk management.

Climate-Driven Farming Alert and Advisory System – An Affordable and Accessible Approach to Farmers

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Abstract

Climate variability brings significant production and income risks in agriculture particularly for Marginal and Small holding farmers who makes decisions based on their previously acquired knowledge regardless of existing weather conditions. Therefore, the need for data driven decision support systems that transforms the weather information into practically viable farm level decision is very much needed at present. This research presents a dual-mode: weather alert and advisory system that integrates real-time weather data with region-specific crop thresholds to deliver confidence-ranked recommendations. The proposed model system functions as a data-driven support framework that converts real-time and forecast weather information into practical farm level advisories. It works on the numerical weather prediction to capture key meteorological parameters, including temperature, relative humidity, rainfall, soil wetness and evapotranspiration. This operational design distinguishes between rainfed and irrigated faming systems that focuses on crop specific threshold limits to be applied according to regional production environments. The present study employed Matlab for computation, algorithms and python for real-time data updates to produce logical indicators and delivery systems. The resulting advisories are disseminated through SMS and call-based alerts to ensure accessibility for marginal and smallholding farmers at no cost basis. This strategy enables climate-responsive timely decisions, reducing dependency on conventional practices and promoting efficient farm management in the face of weather uncertainty.

Impact of Cyber Crimes – A Perspective on Indian Economy

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Abstract

Cyber security is concerned with making cyberspace safe from threats, namely cyber-threats. The notion of "cyber-threats" is rather vague and implies the malicious use of information and communication technologies (ICT) either as a target or as a tool by a wide range of malevolent actors. The 20th century has brought to reality the idea of a global village, where digital technology has interconnected and enmeshed the world economies, cultures and populations. India is no exception, with over 560 million internet users as of 2020, making it as second-largest internet population in the world. While greater connectivity via the World Wide Web (www) promises large-scale progress, whereas it also leaves our digital societies open to new vulnerabilities. It is to be noted that cost of doing business in the digital age is to protect our IT systems and investments. Moreover, economic impact of cyber-crime is one of the most important aspects businesses are focusing today because of failures to protect their intellectual property, financial information and IT networks, which directly have an impact on economic development. Furthermore, once a message sender's identity is unknown, cyberspace provides the means to perpetrate boundless criminal activity among masses, with little chance of being apprehended. Thus, due to the international character of internet, these aforesaid reasons for anonymous communications, which are related to "freedom of expression" may gain new dimensions. These issues can be largely contained only through creating and adopting effective cyber security mechanisms.

Sustainable Urbanism Through Smart Micro-Living: A Modular Container Housing Prototype

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Abstract

This project introduces a “Smart Micro-Living Space” prototype that transforms a 40x10-foot industrial shipping container into a high-efficiency, 400-square-foot modern residence. By prioritizing spatial optimization through multi-functional furniture and vertical storage, the design creates distinct zones for living, working and resting, effectively eliminating the typical constraints of compact housing. A core feature of the unit is its integrated IoT ecosystem, which manages energy consumption and lighting via motion sensors to enhance user comfort. The prototype structure incorporates solar energy harvesting, making it a viable, eco-friendly solution for both off-grid living and high-density urban environments as per Sustainable Development Goals (SDGs 7, 9, 11 & 12). Ultimately, this modular architecture demonstrates that luxury and sustainability can coexist, offering a scalable and affordable model to address the global housing crisis through intelligent technology and minimal environmental impact.

Examining Forecast Accuracy of Heteroscedasticity Models using Financial Data

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Abstract

Financial time series data usually reveal heteroscedastic variance, which confines the applicability of traditional Box–Jenkins models for effective forecasting. Hence, to address this drawback, numerous heteroscedasticity-based models have been developed and broadly applied in financial econometrics. This study examines the forecast accuracy of prominent heteroscedasticity models, namely Autoregressive Conditional Heteroscedasticity (ARCH), Generalised Autoregressive Conditional Heteroscedasticity (GARCH), Integrated GARCH (IGARCH) and Exponential GARCH (EGARCH) using financial market data. The analysis is based on daily NIFTY 50 index data for most recent year, which has been obtained from the official website of National Stock Exchange of India. Stationarity of the data is evaluated using the Augmented Dickey–Fuller test, although the shape and distributional features of data are studied through graphical analysis. Different models are estimated for both opening and closing prices, and their forecast accuracy is assessed using Mean Absolute Scaled Error (MASE) and Mean Absolute Percentage Error (MAPE). The comparative results help to identify the best volatility model for accurate forecasting of financial time series as well as insights into model selection for volatility-driven market data.

Performance Optimization of Cache Oblivious Matrix Multiplication Using Poly-Algorithmic Approach

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Abstract

The present study focuses on performance of cache-oblivious matrix multiplication algorithm on multicore machines has been evaluated using experimental method. The evaluation is against other variants of matrix multiplication algorithm viz: naive-iterative and cache-aware. It is after identifying the performance blockage, a conceptual framework has been developed using poly-algorithmic approach for optimization of cache-oblivious matrix multiplication algorithm. In this new approach, recursion is stopped at optimized base case and then iterative algorithm has been used for completion of computation. The newly optimized cache-oblivious algorithm is further examined against other variants of matrix multiplication algorithms with varying matrix dimensions. The results indicated that newly designed algorithm of matrix multiplication using poly-algorithmic approach has improved the performance of cache-oblivious matrix multiplication algorithm. The present study showed that cache-oblivious approach is very advantageous for present complex architecture of multicore processors because of its simplicity, portability and performance.

Assessment of Climate Change and its Impact on Environment of Chikkamagaluru District in Karnataka Using Geospatial Techniques

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Abstract

This study examines long-term climate variability and its environmental impacts on forest ecosystems of Chikkamagaluru District in Karnataka using an integrated approach combining meteorological analysis, remote sensing and drought indices. Multi-decadal rainfall and temperature data (1960–2022) from the Indian Meteorological Department have been analysed using Mann–Kendall test and Sen's slope estimator to detect climatic trends, while meteorological drought is assessed using the Standardized Precipitation Index (SPI). Forest health dynamics are evaluated using NDVI derived from satellite imagery (2002–2023) and spatial correlation analysis has been applied to assess climate–vegetation relationships. The results indicated that climate variability is marginally increasing but highly variable during rainfall, a statistically significant warming of ~0.9 °C and marked rise in drought frequency and intensity since 1990s. NDVI analysis reveals widespread post-2012 forest degradation, particularly in eastern and southern regions, which is strongly correlated with rising temperature and drought stress. To the contrary, Western Ghats core forests exhibited greater climatic resilience. The findings established climate change—especially warming and drought—as an active stressor amplifying forest degradation, highlighting the need for climate-resilient, drought-informed forest management strategies.

AI-Driven Multimodal Framework for Proactive Stress Prediction Using Heart Rate Variability Analysis

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Abstract

Stress has become a critical determinant of mental health, workplace productivity and overall quality of life in the modern world. Existing stress assessment approaches are largely subjective and fail to capture dynamic physiological variations in real time. To address this limitation, this study proposes an AI-driven framework for stress prediction that leverages heart rate variability (HRV) analysis in conjunction with physiological, contextual and behavioural data. A large-scale multimodal dataset comprising 10,000 records has been utilized to develop and evaluate the multiple machine learning classifiers, including Decision Tree, K-Nearest Neighbors (KNN) and AdaBoost model. The framework classifies stress levels into three categories: low, moderate and high. Moreover, to enhance transparency and trustworthiness, model interpretability is incorporated using feature importance analysis, Local Interpretable Model-Agnostic Explanations (LIME) and SHapley Additive exPlanations (SHAP) respectively. These analyses identified the key stress-related predictors such as heart rate, respiratory rate, galvanic skin response (GSR) and RMSSD. The findings highlighted on effectiveness of integrating HRV-based analytics using artificial intelligence for proactive stress monitoring, personalized intervention and continuous mental health management.

Iris Biometrics for Secure Authentication Using Convolutional Neural Networks and Near-Infrared Imaging

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Abstract

Iris biometrics is recognized as one of the most reliable and secure biometric authentication techniques due to uniqueness and stability of iris patterns throughout an individual's lifetime. Unlike traditional authentication mechanisms such as passwords and PINs, iris recognition offers higher resistance to forgery and identity theft. This research presents a comprehensive study of iris biometric authentication systems using Near-Infrared (NIR) imaging and Convolutional Neural Networks (CNNs). The methodology includes image acquisition, iris segmentation, feature extraction and matching processes. Also, to address the security threats such as spoofing attacks, liveness detection techniques including blink detection and pupil dynamics analysis are incorporated. Furthermore, the integration of blockchain technology for secure biometric data storage is discussed to enhance privacy and data integrity. The proposed approach is suitable for real-world applications such as border control, banking systems, healthcare and mobile authentication, providing a secure, efficient and scalable authentication solution.

Offline LLMs: Enabling Secured and Real-Time Human-AI Conversations Without Internet Connectivity Using On-Device Language Models

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Abstract

The rise of Large Language Models (LLMs) has transformed human-computer interaction by enabling natural, context-aware and human-like responses across a wide range of applications. However, most state-of-the-art LLMs rely on the continuous internet access and cloud-based APIs for processing, raising significant concerns around data privacy, latency, dependency on connectivity and accessibility in offline environments. In critical domains such as healthcare, defense, education and remote areas with limited or no access, this dependency restricts the practical usability of such models. Hence, there is a growing need for a solution that provides secure, real-time and contextually accurate conversational AI experiences without requiring internet connectivity. This project introduces an Offline LLM system that leverages compact optimized language models deployed locally on devices to generate human-like text responses without external network support. The system is built using quantized and fine-tuned transformer-based models such as DistilGPT, TinyLLM or LLaMA variants, that are adapted to run efficiently on edge devices or personal computers. The key optimizations include reduced memory footprint, accelerated inference using ONNX/TF Lite and context window management for maintaining dialogue coherence. The offline architecture ensures data privacy, low latency and high reliability, thus making it suitable for private virtual assistants, offline educational bots, embedded AI tools and enterprise-grade secure environments. This model is trained on diverse conversational datasets to handle various domains while preserving language fluency, contextual accuracy and semantic understanding.

Comparative Analysis of Prepared Coconut Milk Cheese and Market Cheese

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Abstract

Prepared coconut milk cheese, plant-based alternative to traditional dairy cheese, differs significantly from conventional market cheese in composition, nutritional properties and production characteristics. Coconut milk cheese is typically derived from coconut milk (often combined with soy extract or coagulants) and is characterized by nutritional profiles that vary depending on formulation ratios. In contrast, dairy cheese from cow's milk has higher crude fat and ash values. Moreover, it is generally richer in animal protein and essential minerals like calcium and phosphorus. This research study focuses on physiochemical properties, organoleptic characteristics & determination of lipid, carbohydrate and protein & mineral analysis by flame photometer. The results showed an increased moisture, carbohydrate and protein content, decreased lipid content, ash content and higher potassium level in coconut milk cheese when compared to market cheese. Coconut milk cheeses tend to be softer and can feel oilier and greaser, which exhibits lesser elasticity when compared to market cheese. Overall, while coconut milk cheese offers a viable plant-based alternative, market milk cheese remains nutritionally superior as it procured from animal origin. However, the growing demand for sustainable and vegan-friendly options makes coconut milk cheese an attractive alternative for health and eco-conscious consumers.

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AI-Driven Scheduling and Resource Management for Modern Operating Systems

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Abstract

The growing complexity of modern operating systems combined with dynamic workloads across cloud, real-time and embedded environments, created significant challenges for efficient scheduling and resource management. Conventional OS scheduling algorithms often struggle to accommodate unpredictable task patterns, resulting in inefficient CPU utilization, increased latency and higher energy consumption. This research study introduces the AI-driven framework, which has been designed to optimize operating system performance through predictive scheduling and intelligent resource allocation. Thus, by employing reinforcement learning and neural network models, the framework dynamically forecasts task execution times, prioritizes processes and allocates CPU and memory resources in real-time. Experimental results revealed significant improvements in throughput, task completion times and energy efficiency compared to traditional scheduling methods. The study provides solutions by offering scalability and adaptability thereby making it suitable for heterogeneous and cloud-based OS environments. These findings underscored the promise of integrating AI techniques into operating systems to create self-optimizing, workload-aware and highly efficient computing platforms, paving the way for next-generation AI-enhanced OS architectures.

Impact of Animation-Based Instructional Media on Cognitive, Affective and AcademicOutcomes of Higher Secondary Students – A Comprehensive Synthesis

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Abstract

Animation has increasingly been integrated into educational environments as a tool to support meaningful learning, enhance engagement, reduce cognitive load and improve retention among students. This study synthesizes the findings from 20 research papers exploring the effects of animation-based instructional media on higher secondary student outcomes with particular attention to Indian educational contexts and comparable studies abroad. Research evidence suggested that animation supports students' conceptual understanding of complex and abstract subject matter by presenting information through dynamic and multimodal representations, aligning with dual-coding and multimedia learning theories. The research studies conducted in India indicated that animated instructional content when embedded within pedagogy can improve academic performance, engagement and comprehension beyond traditional teaching methods, although the intensity of its effects varies across subjects and learning contexts. Moreover, empirical evidence also highlighted the potential of interactive and animated visuals to motivate learners, sustain attention and foster positive attitudes towards learning. In many developing parts of semantic web, resource restriction, teacher readiness and lack of equal access stay as major challenges. This pluralistic review identifies the consistent trends in enhanced cognitive and affective learning outcomes associated with animation, while underscoring the need for more rigorous and longitudinal research that assesses long-term academic achievement and transferability across curricular domains. The comprehensive synthesis culminates recommendations for educators and policymakers on effective implementation strategies of animation in secondary education and outlines avenues for future inquiry and development prospects.

Evaluation of In Vitro Antioxidant and Antimicrobial Activities of *Basella Alba* Leaves

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Abstract

Basella alba (Malabar spinach) is a member of the Basellaceae family, which is commonly consumed as leafy green vegetable with significant medicinal properties. The current investigation aimed to screen phytoconstituents and analyze the in vitro antioxidant and antimicrobial activities of ethanolic leaf extract of *Basella alba*. The ethanolic extract has been subjected to phytochemical screening using standard methods and antioxidant activity is determined by DPPH radical-scavenging and reducing power assays. Antimicrobial efficacy is evaluated against selected Gram-positive (Staphylococcus aureus), Gram-negative (Escherichia coli) and fungal strains (Candida albicans & Trichophyton rubrum) using agar-well diffusion method. Phytochemical screening revealed the presence of bioactive constituents, including alkaloids, phenols, flavonoids, carbohydrates, tannins, terpenoids and saponins. The ethanolic extract of *Basella alba* leaves showed significant antioxidant activity, as confirmed by DPPH radical-scavenging and reducing power assays. Moreover, varying degrees of antimicrobial activity are detected against all tested bacterial and fungal strains. The results indicated that ethanolic extract of *Basella alba* leaves exhibited promising antioxidant & antimicrobial potential and supported its traditional medicinal use. This research suggested that future research to focus on including the isolation of active phytochemicals, in vivo validation and toxicity studies are required to confirm its therapeutic efficacy. This in turn will contribute to the development of natural antioxidant and antimicrobial formulations for pharmaceutical and nutraceutical applications.

Entrepreneurial Propensity and Sustainability: Insights from Women-Led Ventures in Emerging Markets in Bangalore

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Abstract

Entrepreneurial progression is the need for the hour especially in the context of women entrepreneurship development. Keeping this in view, the present research study investigated the entrepreneurial propensity and sustainability orientation of women-led ventures in Bengaluru at Karnataka, India through mixed-methods approach by combining surveys and qualitative interviews. The findings revealed that 75 percent of respondents aspired to launch their business and 60 percent have reported notable business growth. However, 65 percent of the respondents mentioned that they struggled with capital constraints and 58 percent lack adequate institutional support. While 70 percent of participants recognized the importance of sustainability, wherein only 45 percent implemented sustainable practices largely due to financial limitations. In furtherance, the qualitative insights emphasized on personal drive, peer mentorship and supportive communities, which played crucial roles in their entrepreneurial advancement. The regression analysis explained the importance of entrepreneurial confidence ($\beta = 0.42$, $p < 0.05$) and risk-taking tendencies ($\beta = 0.38$, $p < 0.05$), which have significantly influenced their sustainability adoption, whereas age and education show minimal impact. This study has provided the insights of women entrepreneurs' ability to adapt within the entrepreneurial environment yet revealed existing obstacles, which requires financial backing and policy support to create a sustainable growth in resource-constrained urban settings.

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A Conceptual Framework for Generational Entrepreneurial Logic: Mapping Innovation Mindsets of Millennials and Gen Z in Emerging Economies

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Abstract

Entrepreneurship in emerging economies is evolving rapidly as generational diversity introduces new perspectives in innovation, opportunity recognition and decision-making logic. This conceptual study explores how Millennials and Gen Z differ in their entrepreneurial cognition, innovation mindset and adaptability to institutional and digital environments. While Millennials are often characterized by collaborative and purpose-driven innovation, whereas Gen Z shows a greater inclination towards technology-enabled and independent entrepreneurial behaviour. This research paper synthesises insights from generational cohort theory, entrepreneurial cognition and digital transformation to propose the Generational Entrepreneurial Logic Model (GELM). This theoretical framework explains the relationship between generational traits, institutional support mechanisms and innovation logic. The study emphasizes on how digital ecosystems, educational institutions and socio-cultural factors jointly shape the entrepreneurial reasoning and behaviour across cohorts. The proposed model highlights the differences in digital fluency, cognitive flexibility and perceived institutional support, which influence the entrepreneurial outcomes in emerging markets. This theoretical exploration contributes to understanding the evolving entrepreneurial landscape. Also, it provides a foundation for future empirical studies and policy frameworks to enhance generational inclusivity in entrepreneurship and innovation ecosystems.

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Role of Technology and Innovation in Startup Success: Exploring the Impact of AI, Crowdfunding and Digital Platforms on Entrepreneurial Growth

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Abstract

Technological advances are driving the growth of entrepreneurship in the modern world. Today, businesses operate, innovate and grow within an increasingly global marketplace using technology as a vehicle. This research intends to discuss how technology, innovation and entrepreneurial success interact through lens of AI and Crowdfunding and Digital Platforms. AI powered tools are transforming the way product development is conducted; technologies such as predictive analytics and automation are making it possible for businesses to be flexible, efficient and innovative in the way they engage their customers. Crowdfunding has changed the way of businesses to find the capital for their start-up and create a sense of community between investors in the business; Crowdfunding offers an accessible way for startups to raise money and create early indicators of success. Moreover, it has created opportunities for new businesses to enter multiple market types with less investment in infrastructure due to the ability to use Digital Platforms. This research incorporates theory, as well as empirical evidence of how Tech Enablers (AI, Crowdfunding & Digital Platforms) assist in creating value and sustainability for businesses and provide long-term entrepreneurial resilience. Furthermore, this research highlighted the potential challenges facing Tech E (i.e., Data Security, Technology Dependence and Skills Gaps) that shape the innovation landscape of the future. Finally, the findings highlighted that Technology and Innovation are not just operational tools for companies, but are expected to be strategic imperatives to create value and sustain competitive advantage in our growing Digital and Global Economy.

A Study on Consumer Preference Towards Zepto Online Grocery Shopping

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Abstract

The rapid growth of online grocery shopping in India has significantly transformed consumer purchasing behaviour, especially after the COVID-19 pandemic. Convenience, time-saving benefits and enhanced digital accessibility have encouraged a shift from traditional grocery stores to online platforms. Among these, Zepto has emerged as a leading quick-commerce brand, offering ultra-fast deliveries and a wide range of essential products. This study examined consumer awareness, preference and satisfaction towards Zepto with special reference to South Chennai. The present research focuses on understanding the factors that influence consumers' usage of Zepto app, such as product quality, pricing strategies, delivery speed, customer service and overall shopping convenience. The study also identified challenges faced by users including product defects, delivery delays, mismatch in order details and issues related to customer support. A structured questionnaire has been used to collect primary data from 97 respondents, and the results were analysed using percentage analysis and Chi-square tests. The findings indicated that while consumers highly appreciate Zepto's fast delivery, product variety and ease of ordering, there remain areas for improvement, particularly in communication, handling of perishable goods and increasing user awareness. The study concluded with suggestions to enhance customer experience and strengthen consumer trust. Overall, this research provides valuable insights into evolving consumer behaviour in the online grocery sector and highlighted Zepto's role in meeting modern shopping expectations.

Relationship Between Access to Financial Growth and Sustainability of Student Startups

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Abstract

Finance access is a key determinant that defines the growth and sustainability of student startups in general and in institutions of higher learning in particular in developing countries. Student entrepreneurs are faced with funding challenges such as lack of personal capital, lack of collateral and lack of formal finance that might limit the scalability of startups. The present study examined significance of access to finance in developing student-initiated startups in relation to access in finance institutions, learning and support infrastructure and learning infrastructure for startups. The present study uses structured research questionnaire technique in eliciting information from student entrepreneurs and early-stage startups in different learning disciplines and fields of entrepreneurship. Moreover, this research adopts descriptive and regression analysis techniques in determining the significance of access to finance in developing startups for income generation,employment generation, inventions and expansion. The findings of this research indicated that formal finance access factors such as access and terms of seed capital, terms of lending and access for finance awareness that are crucial in developing student-initiated startups. Furthermore, on a different note, learning infrastructure such as startup incubation, mentorship, networking and entrepreneurship learning can also contribute in developing startups in a manner that ensures support and enhancement in accessing finance.

CSR Initiatives and their Impact on Brand Reputation – An Empirical Study

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Abstract

Corporate Social Responsibility (CSR) has shifted from a voluntary ethical endeavour to a key strategic tool that shapes corporate image and brand reputation. A comprehensive review of past and recent literature reveals that modern consumers, investors and stakeholders increasingly prioritize socially responsible actions, transparency and sustainability when evaluating brands. The previous research studies consistently highlighted a positive association between CSR initiatives and brand-related outcomes such as trust, loyalty and long-term brand equity. However, emerging trends in CSR research underscores the need for integrated, evidence-based approaches that merge consumer perceptions with strategic CSR communication. Against this backdrop, this study aims to examine the role of CSR initiatives in building brand reputation amid a competitive and socially aware marketplace. It adopts a mixed-methodology approach, which integrates quantitative analysis from primary survey data using percentage analysis, correlation and regression with qualitative thematic analysis from secondary sources like CSR reports, sustainability statements and academic works. Quantitative results revealed a robust positive correlation between CSR and brand reputation, with CSR emerging as a significant predictor of brand trust and loyalty. The thematic analysis further indicated ethical responsibility, environmental sustainability, community engagement and transparency are key dimensions through which CSR enhances brand reputation. This study affirms CSR's strategic importance in fostering sustainable brand value and lasting competitive edge.

Role of Encryption in Advancing a Cashless Economy – An Overview on Digital Payments and RBI's Central Bank Digital Currency

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Abstract

The Evolution of digital payments has transformed India's Financial ecosystem, fostering efficiency, transparency and financial inclusion. With the introduction of Unified payment Interface (UPI) mobile wallets and card-based payments consumers and businesses are increasingly moving towards a cashless economy. In recent years, reserve bank of India (RBI) has pioneered the development of a Central Bank Digital Currency (CBDC) – the Digital Rupee to further accelerate this transformation. A critical enabler of trust and adoption in digital payments and CBDC is through encryption technology. Encryption plays a vital role in protecting digital payment systems from fraud, hacking and data theft. It converts sensitive information such as payment details and personal data into secure coded formats that can be accessed onlyby authorized users. Strong encryption helps in building trust among users by ensuring privacy,data security and transaction integrity. Without proper encryption, digital payment systems may face risks related to cyberattacks and financial fraud. This study aims to investigate how digital payments with a focus on the RBI's CBDC and its underlying encryption mechanisms influence the adoption of a cashless economy in India. Also, it explores the behavioural and technological factors affecting the consumer trust and financial inclusion. The study is analytical in nature based on secondary data collected from RBI reports, research articles, government publications and official websites. The findings suggested that combined use of digital payments and CBDC can improve financial inclusion, reduce cash handling costs and increase transparency in the financial system. In furtherance, the effective implementation of encryption technologies is essential to maintain public confidence and system security. The study concluded that digital payments, supported by RBI's CBDC and strong encryption mechanisms. This in turn plays a significant role in advancing India towards a secure and sustainable cashless economy.

Forecasting Gold and Silver Price Dynamics in 2026-30 – A Comparative Study

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Abstract

The present study analyzes the price behaviors of gold and silver in the period of 2024-25 and a forecast is generated for the period 2026-2030. The context for this study is the mounting global uncertainty triggered by the implications associated with inflationary trends, changes in monetary policies and other risks. There is obviously a resurgence in the use of precious metals for their strategic benefits, which is underpinning the relevance of this research. The study leans on previous work and methodology consequently includes the use of descriptive statistics, Augmented Dickey Fuller unit root tests, correlation analysis, multivariate regression analysis, diagnostic tests and ARIMA models. The results clearly demonstrated a similarity in the price behaviours of gold and silver, but they clearly differ in terms of volatility and reactions to the associated financial parameters. The parameters for price behaviors in case of gold tend to be driven by variations of exchange rate and interest rate variations alongside solidifying status accorded to gold. Similarly, the parameters for price behaviors in case of silver tend to be more sensitive to stock market variations, solidifying the hybrid nature of latter. The results in accordance with forecasting of gold and silver for the period 2026-2030 clearly demonstrates an upward movement while there is obviously more uncertainty associated with the forecast for price behaviors for silver.

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Importance of Digital Skill Development in Promoting Rural Entrepreneurship in Karnataka: A Conceptual Study

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Abstract

Digital skill development is widely acknowledged as a key driver of sustainable economic growth, fostering job creation, alleviating poverty and ensuring fair distribution of economic benefits, especially for rural regions, wherein entrepreneurship can drive employment, local valueaddition and poverty reduction. This study conceptually explores the impact of digital skills on the development of rural entrepreneurship in Karnataka, India. The entire study is based on secondary literature, policy documents and conceptual frameworks. The study intended to develop a conceptual model based on observations by linking digital competencies to entrepreneurial outcomes such as market access, product innovation, financial inclusion and operational efficiency. This research identified major barriers, infrastructure gaps, gender and social barriers, skill mismatches and limited access to finance and proposes policy and practice. This in turn facilitates the possible recommendations for a comprehensive empirical research, government agencies, educational institutions, NGOs and private partners towards promoting sustainable rural entrepreneurship.

Impact of Social Media Influence on Millennials' Investment Decisions – An Empirical Analysis on Mediating Role of Financial Literacy

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Abstract

The rise of social media has transformed the way millennials access financial information and make their investment decisions. This study investigates the impact of social media influence on the investment decision-making of millennial investors with a specific focus on mediating role of financial literacy. A structured questionnaire has been administered to a sample of millennials actively involved in investing, assessing their exposure to social media, level of financial literacy and investment behaviour. The study employed descriptive statistics, correlation analysis and mediation analysis to examine the relationships among independent and dependent variables. The findings revealed that social media significantly affects their investment decisions often amplifying behavioural biases such as herd behaviour and overconfidence. However, financial literacy is hypothesized to mediate this relationship, enabling millennials to make more informed and rational investment choices despite social media pressures. The study contributes to the growing body of literature on behavioural finance and digital investing, providing practical insights for investors, financial educators and policymakers on improving investment outcomes among millennials.

A Study on Impact of Consumer Reviews and Ratings on Online Shopping Decisions

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Abstract

Today, rapid growth of e-commerce, online consumer reviews and ratings have become a vital source of information influencing purchasing decisions. Moreover, absence of physical product inspection has been a cause for consumers to increasingly rely on electronic word-of-mouth (eWOM) to reduce uncertainty, assess product quality and build trust. The present study aims to examine the impact of consumer reviews and ratings on online shopping decisions, identify key review features influencing purchase behaviour and understand the psychological mechanisms underlying consumer trust and decision-making. A quantitative descriptive survey design has been adopted, wherein data has been collected from 50 Nigerian online shoppers using a structured online questionnaire. The key variables measured includes review valence, volume, credibility, star ratings and consumer trust. Data analysis has been conducted using descriptive statistics and correlation analysis, wherein the findings revealed that majority of respondents regularly read online reviews before making purchases and place high importance on positive reviews and star ratings. Also, the review credibility and volume significantly influenced purchase intentions, while negative reviews showed a stronger emotional impact due to negativity bias. Thus, ensuring review authenticity and transparency are quite essential for businesses to enhance its credibility and consumers' confidence. The study concluded that online reviews and ratings play a crucial role in shaping consumer trust and online purchasing decisions.

Entrepreneurship Development & Innovation – A Comprehensive Overview

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Abstract

Entrepreneurship development and innovation play crucial roles in driving economic growth, creating jobs and gaining competitive advantages in both developed and developing nations. This research takes a close look at the earlier research studies and current trends in entrepreneurship. Moreover, it aims to offer a well-rounded overview of how innovation-driven entrepreneurship can lead to the establishment of new businesses, promote sustainability and generate long-term value. The research literature suggested that several factors influence entrepreneurial development. The study primarily aims to explore how entrepreneurship development interacts with innovation. Also, it intends to highlight the significance of this relationship in addressing challenges like market uncertainty, limited resources and fast pace of technological change. The present study gains importance because it offers insights that may aid policymakers, academic institutions and entrepreneurs in fostering innovation and enhancing the entrepreneurial landscape. This research employed descriptive and analytical methods, relying on a systematic review of secondary data sourced from journal articles, reports and conference publications that focused on entrepreneurship and innovation. This research highlighted that fostering an environment conducive to innovation is quite crucial for entrepreneurship development. The present research not only involves providing the necessary resources and support but also nurturing a culture that encourages creativity and risk-taking. Furthermore, it points out that collaboration among various stakeholders is the key to driving innovation. In furtherance, partnerships between businesses, universities and government entities can lead to the sharing of knowledge and resources, facilitating all parties involved into promoting entrepreneurship development and innovation. This collaborative approach can help in addressing the challenges using collective strengths.

Fostering Entrepreneurship and Innovation: Catalysts for India's Startup Ecosystem

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Abstract

Entrepreneurship and innovation are inseparable aspects for every nation in this globe aspiring towards socio-economic progression. The present study explores the multifaceted dimensions of entrepreneurship by examining attitudes, challenges, innovation practices and support mechanisms influencing new business ventures. It is structured into five sections that together encompasses 25 statements aligned with a five-point Likert scale. The first section, focuses on entrepreneurship & economic contribution, which measures the perceptions of entrepreneurship's impact on community welfare, job creation and economic growth. The second section is into addressing the challenges faced by new businesses, which identifies the barriers such asfunding limitations, market access, human resource constraints and regulatory restrictions. The third section, envisages on innovation & business growth, wherein it evaluates how creativity, technological adoption and problem-solving drive competitive advantage and long-term sustainability. The fourth section, concentrates on technology, research & collaboration, which assesses the role of academic linkages, research access and governmental partnerships in fostering innovation. The final section, support systems & skills development, which emphasizes on mentorship, training, networking, and risk tolerance as critical entrepreneurial enablers. Thus, by integrating these components, the instrument provides comprehensive insights into entrepreneurial behaviour, ecosystem readiness and socio-economic conditions that promote or hinder enterprise growth thereby guiding policymakers, educators and ecosystem stakeholders in designing targeted interventions.

A Study on Impact of Digital Technologies on Entrepreneurship Growth

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Abstract

The rapid advancement of digital technologies has transformed the way of entrepreneurial ventures that operate and grow in today's competitive business environment. Technologies such as digital marketing tools, social media platforms, e-commerce websites, cloud computing and digital payment systems have reduced traditional business barriers by improving communication, expanding market reach and enhancing customer engagement. Increased internet penetration and smartphone usage have further accelerated digital adoption, especially among start-ups and small business enterprises. The purpose of this study is to examine the impact of digital technologies on entrepreneurial growth and to analyse how the adoption of digital tools contributes to business expansion, operational efficiency, innovation and competitiveness. The study also aims to assess the level of digital awareness among entrepreneurs and identify challenges faced in technology adoption. The study adopted descriptive research design and primary data have been collected through a structured questionnaire administered to entrepreneurs and small business owners using convenient sampling. Secondary data are gathered from journals, reports and online sources related to digital entrepreneurship. The collected data are analyzed using percentage analysis and basic statistical tools. The findings revealed that entrepreneurs who actively use digital technologies experience increased customer reach, improved sales performance, reduced marketing costs and better business efficiency. However, limited digital skills and lack of technical support are identified as key challenges. The study highlighted the significance of digital technologies in promoting sustainable entrepreneurial growth. Also, emphasized the need for digital literacy, institutional support and effective digital strategies to strengthen entrepreneurial ecosystems and long-term economic development.

Managing Diversity in Higher Education: A Critical Perspective

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Abstract

Managing diversity has become a primary issue in today's higher education, primarily in India wherein there is a wide miscellany of people. Colleges and universities now have students from different backgrounds including various social and economic levels, cultures, languages, genders and abilities. Due to this dominant standing, managing diversity and promoting fairness efficaciously is becoming an increasingly critical challenge in higher education institutions in India. This study aims to establish how higher education institutions strategically maneuver the key aspects of Diversity, Equity and Inclusion (DEI) to contribute more sustainably towards nation building and nurturing global citizens. Having extracted sizeable information from the existing literature, regulatory policies, recent studies and a survey, this study explores what helps and stops effective diversity management in higher education institutions. The survey has taken a deep insight at how diversity is interpreted, put into action and experienced in the higher educational institutions with special reference to the state of West Bengal in India. It assesses the role of leadership cadre, governance policies, rules and regulations that institutions follow and their overall culture in creating an environment where everyone feels befitted. The present research has probed into the problems like discrimination and biased treatment based on caste, gender inequality, financial hindrances and issues with accessibility. Even though some special efforts and policies have been made to deal with these issues, there is still a sizeable gap between what the implementation of these policies and strategies aimed at and their actual outcomes. The findings indicated that supportive leadership and governance, fair policies, infrastructure and financial enablement are seen as enablers in making diversity work. However, restricted awareness, tokenistic practices, discrepant implementation and doggedness of implicit biases remain major obstacles to achieving genuine inclusion. The study also exhibited that teaching pedagogy and resources available can be very different between public and private colleges, which makes it arduous to have a balanced educational output. Also, this research suggested that managing diversity needs to move from just having a few people from different groups portrayed to actually making sure everyone is included in purposeful ways. Diversity, Equity and Inclusion (DEI) should be among the core values and principles governing on how the institution is running, subjects are educated, lessons are delivered respectively alongside overall ambience of the campus to be taken into consideration. The study articulated that DEI efficacy must be an essential part of institution's long-term plan and not just something they do to follow as regulations.

Strategic Transformation in Software Engineering Roles on AI-Native Platforms – A Comprehensive Review

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Abstract

Artificial intelligence has been a major cause for the transformation on how digital systems are conceptualized, designed, built and sustained in the software development industry in the recent years. The AI aided code generation, testing, optimization and deployment necessitates reshaping the division of labour between humans and machines. Historically, software engineers have been valued for efficient and error-free coding skills. AI platforms have challenged the traditional software development system by automating these tasks and accelerated the urgency for architectural rethinking and redesigning, realigning systems integration, strategic review, redefining systemgoals and re-evaluation of system constraints and AI generated outputs. Globally, organizations adopting AI-native platforms for software engineering not only report gains inproductivity and speed but also encounter new challenges related to governance, accountability and quality assurance. This study emphasizes on possibilities and opportunities for human–AI collaboration in AI-native software development environment and examines how the software engineer's role is evolving from coder to strategic architect in response to these technological changes in the global IT Industry. It also identifies the key drivers that facilitates the eventual transition from coding centric work to architecture centric supervision. The present research aims to contribute to academic and practical worlds a sustainable workforce in the ever-transitioning world. The researchers have employed a systematic literature review and analysis of secondary data, which included peer reviewed journal papers and articles, conference proceedings, industry reports and documented case studies so as to capture both academic and practitioner perspectives on AI development. A thematic analysis approach has been adopted to synthesize insights across diverse sources and textual data and identify recurring themes related to role transformation, governance mechanisms, skill reconfiguration and ethical considerations. This method enabled the identification of patterns that transcend individuals, technologies and / or organizations to offer a generalized understanding of structural changes occurring within the IT sector. The findings revealed that AI platforms significantly alter the distribution of cognitive labour within software development teams. Practices like routine coding, debugging and testing tasks are increasingly getting automated, thus enabling faster development cycles and reduces manual effort. As a consequence, software engineers are required to devote more timein defining architectural patterns, setting performance constraints and reviewing AI-generatedoutcomes

for alignment with system objectives as a whole. In furtherance, the findings indicated that supervisory roles require a deeper understanding of system interactions and potential failure modes as well as the ability to intervene when the automated processes produce unexpected and unintended outcomes. This research suggested that successful adoption of AI-native platforms depends on organizational support structures, teams that clearly understand accountability and invest in architectural governance and continuous learning.

Impact of Personalisation in Shaping E-Commerce Relationships

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Abstract

The rapid growth of e-commerce has shifted business focus from transactional selling to building long-term customer relationships, making personalisation a critical strategic tool. Existing literature highlights that personalized recommendations, offers and communication enhance customer satisfaction and loyalty. However, recent studies also emphasize on growing consumer concerns related to data privacy, transparency and trust. This research aims to examine how personalization influences e-commerce relationships by analysing customer perceptions of trust, satisfaction and loyalty, while also addressing the emerging personalization–privacy paradox in the Indian context. The study is empirical in nature based on primary data collected from 120 active online shoppers using a structured questionnaire. The research adopted descriptive and analytical design, employing statistical tools such as Chi-Square test to examine associations between demographic variables and personalization perceptions. The findings revealed that personalization significantly improves customer satisfaction, engagement, repeat purchase intention and willingness to recommend platforms. Respondents have reported that feeling more valued and emotionally connected to platforms that offer relevant and timely personalized experiences. Moreover, the present study identified strong concerns regarding data usage and privacy, indicating that excessive or opaque personalisation can reduce trust. A key observation is that consumers are more willing to accept personalization when privacy protection and transparency are assured. This research suggested that personalization can effectively strengthen e-commerce relationships only when supported by ethical data practices, user consent and privacy-first strategies, making trust as the central driver of sustainable digital customer relationships.

Emergence of Fintech in Personal Finance Management: An Empirical Study on User Behaviour in India

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Abstract

The rapid expansion of Financial Technology (Fintech) has transformed personal finance management by enabling individuals to manage payments, savings, investments and credit through digital platforms. While existing studies have highlighted the widespread Fintech adoption in India, wherein only limited empirical evidence exists on whether such adoption leads to meaningful improvements in financial behaviour and decision-making. This study examines the impact of Fintech on personal finance management by analysing user perceptions, financial awareness and behavioural outcomes in the Indian context. This empirical study has adopted descriptive design based on primary data collected through a structured questionnaire administered to Fintech users, which has been supported by secondary insights from academic literature and industry reports. The findings indicated that Fintech usage significantly enhances financial awareness, transaction convenience and short-term money management, particularly among younger users. However, its influence on disciplined savings, long-term financial planning and investment understanding remains moderate, highlighting a gap between access to digital tools and their effective utilization. Moreover, the concerns related to trust and data security further influence the depth of platform engagement. The study concluded that while Fintech adoption in India is extensive, sustained financial well-being depends on improved user education, transparency and behaviour-oriented design within Fintech platforms.

Exploring the Factors Influencing Whistleblowing Behaviour in Workplaces – A Diagnostic Study

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Abstract

Creating a safe work environment for employees and establishing well-defined whistleblowing mechanisms are crucial for sustaining ethical and responsible workplace practices in any organization. The 'whistleblowing' indicates employees' reporting observed wrongdoing or uncovering unethical or illegal activities to promote transparency to internal (ex: compliance officers, HR departments, etc.) and/or external parties with the intent to safeguard organizational integrity, public trust and regulatory compliance. It helps in identifying and rectifying wrongdoing before it escalates into legal, financial and reputational harm. Employees tend to remain silent due to lack of anonymity or confidentiality, fear of retaliation, distrust in reporting systems and cultural pressures that discourage speaking up. This study develops a multi-level framework linking individual attributes, organizational culture & practices and external (legal/social) conditions to contribute towards building safe and ethical workplaces and protect & encourage whistleblowing behaviour through defined mechanisms. It explores the influence of individual-level factors like personal values, conscientiousness and neuroticism; organization-level factors like peer pressure, leadership commitment, reporting mechanisms, non-retaliation policies and ethics training. Also, includes external factors like legal provisions and socio-cultural norms on whistleblowing behavior of employees in their workplaces. A mixed-method design has been adopted, wherein semi-structured interviews with focus groups, compliance officers and HR leaders across multiple organizations to surface context-specific enablers and constraints that influence whistle blowing behavior and multi-industry employee survey measuring: a) personal ethics/value orientation b) personality markers (conscientiousness & neuroticism scales) c) demographic variables d) perceived organizational culture & leadership commitment (e) mutual trust (f) awareness and trust in reporting mechanisms and g) perceived legal protection, as the determining factors of whistleblowing intention and behaviour in workplaces. The findings of the study established that personal ethics/values and conscientiousness positively predict whistleblowing intention, whereas neuroticism negatively predict it. The effect of individual drivers of whistleblowing intention is amplified in supportive cultures. Employees high in moral values are most likely to report when they perceive credible non-retaliation and leadership backing. Perceived peer pressure suppresses reporting unless counterbalanced by strong formal protections. In furtherance, training and awareness programs influence

whistleblowing intention by increasing confidence and knowledge of channels. The legal protection to moderate the retaliation strengthens the link between whistleblowing intention and actual reporting behaviour. The study suggested that organizations seeking a safe work environment should embed and publicize clear non-retaliation policies, confidential multi-channel reporting mechanisms (hotline, digital portal & ombudsperson) backed by visible enforcement. Furthermore, the investment in ethics training and awareness programs, leadership accountability, monitoring peer climate viaperiodic culture audits to detect silencing norms and aligning internal policies with statutory regulation framework are some of the measures that organizations/practitioners can map onto compliance, HR and risk-management systems.

Competency Based Recruitment and Its Effect on Employee Performance and Organizational Performance – An Empirical Study

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Abstract

Organizations need to be highly competitive to have an edge over their competitors in this era of globalization. The work place requires leaders who have a new set of skill, knowledge and attitudes to steer their team in the right direction, face adversity with agility, diversity and equality. These leaders should possess managerial competencies, which is not just knowledge and skills, but involves the ability to meet complex demands and mobilize psycho-social resources in times of challenges. These competencies are the building blocks of companies to achieve its vision, mission and goals creating value and improving business performance. Several researchers have attempted to identify the competencies required for leaders, yet universal competencies have not been arrived. Therefore, the competencies would largely depend on the type of organization, role and outcome expected. In furtherance, many organizations after having recruited the managers based on competency do not take the effort to use these competencies during performance appraisal. The lack of research literature in this area bears testimony. Hence, to address this gap this study has attempted to understand if the leader's performance matches with competencies possessed by them. Therefore, this empirical study has been conducted on the performance of leaders who play a managerial role in the organization and responsible for business growth. The findings highlighted significant positive relationship between the core competencies of leaders and performance. The future mediation of managerial competencies in performance exhibited a positive significant correlation suggesting that managerial competencies are important for performance of the leaders.

Brand Loyalty Through Sustainability and its Influence of Green Marketing in Eco-Friendly Personal Care Products – An Empirical Study

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Abstract

This study explores the impact of green marketing on brand loyalty within eco-friendly personal care sector, an industry experiencing rapid growth as consumers increasingly prioritize sustainability, natural ingredients, ethical sourcing and environmentally responsible products. Although previous research studies have highlighted the importance of eco-labels, recyclable packaging, cruelty-free certifications and transparent communication in shaping consumer trust. This indicated that there remains a clear gap in understanding how these green marketing elements translate into long-term loyalty, particularly in the evolving Indian market. Hence, addressing this gap, the present research intends to examine how green marketing practices influence consumer trust & attitudes and to analyse how these attitudes, in turn, shape loyalty towards eco-friendly personal care brands. The primary data is collected from 180 respondents through a structured 22-item Likert-based questionnaire designed to capture multiple dimensions of consumer behaviour. The sample frame comprised individuals who use or are familiar with eco-friendly personal care products, primarily young adults, students and working professionals. Moreover, respondents have been selected from urban and semi-urban areas of Telangana and used snowball sampling techniques around four key constructs: product usage & brand awareness, attitudes toward green marketing, price & availability perceptions, and brand loyalty behaviour. The statistical techniques included correlation, multiple regression and t-tests to evaluate the strength and direction of relationships among these variables. The findings indicated that green consumer attitude is the most influential predictor of brand loyalty, while scepticism significantly diminishes trust and reduces the likelihood of repeated purchases. Also, the regression results further confirmed that green marketing efforts have a measurable and meaningful effect on loyalty outcomes. The study suggested that companies should prioritize transparency, credible eco-certifications, sustainable packaging innovations and wider accessibility with affordable pricing to strengthen consumer trust and adoption. In conclusion, the study demonstrated that authentic, credible and transparent sustainability initiatives are crucial for cultivating strong and enduring brand loyalty among today's eco-conscious consumers.

Generation Z in Workplace – A Systematic Review on AI Capabilities, Emotional Intelligence Inclusion and Performance Dynamics

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Abstract

Generation Z (Gen Z) are those born between 1997 and 2012. They are the digital native generation having high technical proficiency with distinct character of emotional well-being expectations. The higher demand for workplace flexibility requires a balance between both emotional competencies and technological capabilities. Here comes the Artificial Intelligence (AI) that has been revolutionizing Information Technology (IT) and knowledge industries. The current business market driven automation, personalization and SMART decision-making. Hence, Emotional Intelligence (EI) has been considered as the key competence to control AI-induced stressors such as technostress and enhance engagement, resilience and performance of Gen Z professionals. This systematic review synthesizes 60 research articles, case studies and reports between 2019 and 2025 that examined EI skills (ex: self-awareness & empathy) and AI capabilities (ex: generative AI tools such as ChatGPT & mindfulness apps such as Ajivar) and engagement with each other to influence Gen Z's work performance. This research has confirmed that Gen Z digital nativism increases AI performance but may lead to emotional distance without EI intervention. EI is addressing such problems by strengthening resilience and teamwork. The review posits a conceptual model in which AI and EI as separate variables impact performance via Gen Z characteristics and organizational support. The study identified that gaps evident are sparse longitudinal research and untested emotional reactions to AI in international IT environments.

Acquisition of Prompting Skills in Creative and Effective Use of AI–Assisted Communication – A Diagnostic Study

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Abstract

The purpose of this study is to investigate on how the acquisition of prompting skills influences the creative and effective use of AI-assisted communication among educators and students. Using a mixed-methods approach, this research combines qualitative interviews with teachers and quantitative surveys measuring students' AI interaction outcomes. The sample consisted of selected engineering colleges in Kurnool, Kadapa and Annamayya Districts of Andhra Pradesh with 50 teachers (male & female) and 100 students aged 18-21 years. Data collection has been conducted through semi-structured interviews with teachers and a pre- and post-survey of students analyzing their use of AI tools for language learning. The Technological Pedagogical Content Knowledge (TPACK) framework guided the analysis. The study explicitly links development of prompting skills to improved language learning outcomes such as increased accuracy in AI-generated responses and enhanced communication efficiency. AI tools, specifically chatbots and language models, were used pedagogically to support real-time dialogue practice and feedback. The findings revealed that students who developed stronger prompting skills showed greater success in using AI tools for language learning, while teacher interviews highlighted the importance of guiding students in crafting precise prompts. This study concluded with the recommendations for integrating prompting skill development into language teaching curricula offering teachers strategies to enhance AI-assisted communication in classrooms.

Relationship Between Technostress and Sleep Quality among Psychology Students

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Abstract

Today, with recent changes in academic guidelines and an increasing reliance on technology for learning, assessment and communication, psychology students are facing growing exposure to digital platforms. While this enhances accessibility it simultaneously increased technostress thereby disrupting sleep. The study examines the relationship between technostress and sleep quality among psychology students in India. The present study adopted purposive sampling for collecting data from psychology students aged 18-25 years through self-reported tools, which are used to measure the technostress and sleep quality. The results suggested that there exists a significant correlation between technostress and sleep quality, suggesting that higher levels of technostress are associated with poorer sleep quality. The findings also showed that technostress plays an important role in causing sleep-related issues in the context of academics. Also, it highlighted the importance to promote digital well-being and good sleep hygiene in order to improve the academic performance and mental health of psychology students.

Teaching, Technology and Communication: Adapting Higher Education Academicians' Digital Competence to Post-Covid Classrooms

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Abstract

Sustainable teaching in times of technological onslaught seeks an optimal way to assimilate technology, teaching and traditional classroom practices. The adverse effects of human-machine interaction synchronously evolve with technological progression, wherein academicians' digital competence seeks recalibration. Beyond ongoing chasing of elusive coping capabilities, building resilient techno-teaching systems retaining academicians' autonomy (through tested teaching practices) and its effectiveness for holistic education should be the call of digital competence. Between technology and teaching, contemporary higher education academicians stand at a crucial juncture, whereas on one hand technological ubiquity demands an exclusive territory in academe (edtech / digital tools and platforms). On the other, sustaining relevance, voicing for true purpose of education, countering techno-determinism in academia and bracing for student digital distraction are among few issues posing continuous threat to teaching fraternity. Moreover, to rebound against such techno adversaries, a holistic communication effectiveness bridging sustainable teaching-technology-communication in academic context demands revival. Explicit technology use in academics is enjoying an upper hand marginalising the true purpose of education. The tools, strategies, learning outcome, digitally driven engagement activities, customised learning provisions and growing competition to lead in this technological race is eventually compounding into information overload leaving no / less time for actual knowledge enhancement. Technology is driven by innovation, so it evolves and cannot be static. Education on the other hand is a phenomenon marked by time-tested strategies enhancing student's knowledge to attain their purposive best goals. Effective communication in classroom becomes the vehicle to infuse students with this understanding. The question 'whether academicians are ready to adapt communication as their digital competence?' stands valid hitherto, which needs to be addressed for bringing sustainable development in academic teaching.

Nomadic Lives at Margins and Socio-Economic Challenges Faced by Gujjar and Bakarwal Tribes at Jammu & Kashmir

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Abstract

The Gujjar and Bakarwal tribes are among the largest Scheduled Tribe communities in Jammu and Kashmir, traditionally sustaining their livelihoods through nomadic and transhumant pastoralism. Despite receiving Scheduled Tribe status in 1991, these communities continued to face deep-rooted socio-economic marginalization. This study examines the impact of their mobility on access to education, healthcare, land rights and political participation. Also, intends to assess how state policies respond to the lived realities of their nomadic life. Primary data are collected from Rajouri and Anantnag districts through household surveys, focus group discussions and key informant interviews. The findings indicated that high levels of illiteracy, particularly among women, limited availability of mobile schools & health services, weak awareness & implementation of Forest Rights Act and low political participation. Traditional pastoral livelihoods are increasingly threatened by pasture degradation, administrative barriers and absence of institutional support, resulting in unplanned shifts toward insecure wage labour. This study also highlighted the disproportionate burden borne by women, who play a central role in migration and household survival but remain largely excluded from governance and policy processes. This research argues on development interventions that remain poorly aligned with the mobile realities of Gujjar and Bakarwal life. Also, it concludes by advocating the context-sensitive, mobile-friendly and rights-based policy frameworks to ensure the Gujjar and Bakarwal tribes' inclusive sustainable development.

Neurocognitive Function of Children with Reading Difficulties: A Remediation Study

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Abstract

Human intelligence has been discussed from the general mental ability of Spearman and Cyril Burt to that of specific characteristics indicated by Howard Gardner's multiple intelligences. The genesis of mental developmental delay and gap between achievement & intellectual ability is clearer to be seen by the age of 8 in young primary students. This research study analyses the neurocognitive function of children with reading and spelling difficulties based on Luria's three functional units of brain namely: Attention, Simultaneous & Successive processing and Planning. Moreover, the PASS (Planning, Attention, Simultaneous and Successive) theory of intelligence is based on Luria's psychological work. In furtherance, Cognitive Assessment System is capable of measuring the PASS cognitive function. The Wide Range Achievement Test 4 (WRAT-4) has been used to determine the reading and spelling process. CAS and WRAT-4 are assessed individually among 50 students who is identified to be having reading and spelling difficulties at a private school in Chennai. The PASS scale standard scores showed that 41 percent are at average level, 30 percent under low average level, 26 percent fall below average level and only 2 percent are placed under well below average level. There is no significant difference among genders in terms of cognitive processing. However, girls scored higher on planning and attention processing, while boys scored higher on simultaneous and successive processing. The results of WRAT-4 indicated low scores on comprehension ($M = 65.54$, $SD = 5.10$) and spelling ($M = 67.82$, $SD = 12.06$). Correlation analysis indicated that there exists a relationship between cognitive processes and reading processes. The specific cognitive processes of planning and successive had a significant relationship with word reading ($r = 0.320$, $p < .05$; $r = -0.286$, $p < .05$). While attention processing has been negatively correlated with comprehension ($r = -296$, $p < .01$). The findings are discussed and intervention has been proposed. This intervention technique might facilitate the abilities of particular cognitive processing in enhancing the reading process.

Exploring the Relationship between Smartphone Use and Shyness among Young Adults

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Abstract

The widespread adoption of smartphones has significantly transformed social interaction patterns among young adults. Although smartphones enhance communication and access to information, excessive use has been linked to various psychological concerns, including social withdrawal, loneliness and anxiety. One psychosocial construct potentially influenced by increased reliance on mediated communication is shyness, characterized by discomfort, inhibition and avoidance in social situations. The present study examined the relationship between smartphone use and shyness among young adults. A quantitative correlational research design has been employed, which included 100 sample respondents falling in the age-group of 18-25 years are selected through convenience sampling. The data collection has been carried out using standard scale (Smartphone Use Scale to assess the intensity and patterns of smartphone usage) and test (Shyness Assessment Test to measure levels of shyness) respectively. Statistical analyses have been conducted to determine the strength and direction of relationship between the variables. The findings revealed the existence of significant positive association between higher levels of smartphone use and increased shyness among young adults. The study contributed to growing literature on the psychosocial effects of digital technology and underscores the need to examine how smartphone use influences social behaviour and personality traits of the respondents. The findings have important implications for mental health professionals, educators and policymakers in designing the appropriate interventions that promote balanced smartphone use and foster healthy interpersonal communication among young adults.

Conceptual Study on Resilience and Mental Health among Police

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Abstract

This research investigates how resilience training and psychological support initiatives affect the well-being and job performance of police personnel. This research underscores the effectiveness of various resilience training programs in reducing stress, improving coping strategies and enhancing psychological well-being through a systematic review. The quantitative findings indicated a decrease in burnout, whereas the qualitative feedback highlights enhancements in emotional regulation, teamwork and job satisfaction. Moreover, physiological indicators like cortisol levels validated that mindfulness training has a considerable effect on reducing stress and bolstering emotional resilience. Additionally, the research investigated peer-support initiatives that cultivate social support, mitigate stigma and enhance officers' mental health. The results of this study have emphasized the need for standardized resilience training methods to guarantee comparability and effectiveness. Furthermore, the exposure of police officers to high-risk situations contributes to mental health challenges like Post-Traumatic Stress Disorder (PTSD), burnout and anxiety. The study pinpoints protective factors such as strong peer networks and organizational backing that help to reduce these risks. In high-pressure situations, resilience and adaptive coping strategies enhance decision-making, emotional regulation and operational effectiveness. It also investigates the psychological effects of COVID-19 on law enforcement personnel as well as challenges and work-life balance problems that are specific to gender. Also, the findings showed that structured resilience programs, wellness initiatives and policy reforms are crucial for promoting a healthier policing environment. Ultimately, the study underscores the necessity of thorough mental health interventions and resilience-building strategies to improve the law enforcement officers' well-being and effectiveness.

Psychoanalytical Study of Namita Gokhale's Selective Fiction Works

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Abstract

In the firmament of Indian English Fiction, Namita Gokhale is a remarkable woman writer. Most of her works are centered around women's contemporary problems. The present study involves analyzing her character's thoughts, feelings and their behaviors through the lens of psychoanalytical theory developed by Sigmund Freud. The entire study is based on secondary data sources and adopted descriptive method to explain the observations. As for Simone de Beauvoir, woman is a social construct. However, Gokhale in her works has created immortal women characters who faced many hardships and eventually overcame them to assert their autonomy, tenacity and identity. When Gudiya, the narrator of novel Gods, Graves & Grandmother states that "I did not even know who my father was and neither, for a fact, did my mother or grandmother" and mentions that we will come to know the situation from which the characters emerged. Before marriage, Gudiya became pregnant with Kalki. Like any unwed mother condemned in the society, she too experienced similar views and ill-treatments. Gokhale delineates Gudiya's tenacity passing through intricate relationships ultimately shaping her own destiny. Thus, Gokhale showcases resilience of iron-willed women characters through sexual autonomy and self-discovery. In another fiction work of Gokhale 'The Blind Matriarch' projects Matangi-Ma, an eponymous character who is the embodiment of resilience of human spirit. She has been shown as undeterred by her blindness and widowhood, which portrayed that she has lost only her sight, but not her vision. She is not beautiful but quite dutiful. Her blindness is symbolic of our nation, which has been blinded by its age-old divisions that have been falsely seeded in the minds of this society. The characters presented in this novel begin to reexamine their purpose and reconcile with old secrets to form new bonds.

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Experiential Learning – A Road Map for Entrepreneurship Development Among Students

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Abstract

The Experiential Learning Programme (ELP) equips undergraduate students with professional competence, an entrepreneurial mindset and self-confidence thereby enabling them to become entrepreneurs than employees. The students in 7th and 8th semesters of the College of Community Science at PJTAU are included as sample respondents in this present study. A total of 70 students between 2021 and 2025 have been included for data analysis out of which 47 students opted for product-based ELPs, while 23 chose service-based ELPs. Most of the students pursued ELPs in 'Extension Education & Communication Management' followed by 'Apparel & Textiles' and 'Food & Nutrition'. Teacher guidance emerged as the primary source of idea generation for both product-based (36 percent) and service-based (57 percent) ELPs, followed by market surveys and inputs from friends and peers. The prototype development has been undertaken by majority of the students in both product-based (81 percent) and service-based (83 percent) ELPs to enhance confidence and support promotional activities. While most service-based ELP students required 2-4 weeks for prototype development, wherein a large proportion (76 percent) of product-based ELP students completed this within one week. In furtherance, assessment of raw material suitability (32 percent) and visual appeal of the product (23 percent) are identified as the key perceived benefits of prototype development. The most commonly used channels for procuring raw materials are offline stores followed by online platforms and Instagram. Students in both categories reported net profits of ₹5,000 followed by ₹6,000-₹10,000 with a notable proportion of service-based ELP students earning net profits exceeding ₹20,000. The findings highlighted effectiveness of ELP in fostering entrepreneurial orientation and income-generating capabilities among undergraduate students.

Bhagmati and Dimple: Gendered Marginality and Urban Violence in Delhi: A Novel and Narcopolis

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Abstract

This research provides a view on comparative women studies reading of Khushwant Singh's "Delhi: A Novel" and Jeet Thayil's "Narcopolis" by focusing on two central marginalized women characters—Bhagmati and Dimple. The important aspect is that it has been set against the urban landscapes of Delhi and Bombay, wherein the novels portray Indian cities as gendered spaces marked by violence, exploitation and historical trauma. Through feminist literary criticism and postcolonial feminist theory, the study examines how women's bodies become symbolic sites upon which the forces of patriarchy, colonial legacy and postcolonial urban decay are enacted. Bhagmati, a hijra and sex worker in the 'Delhi: A Novel', embodies gendered marginality, sexual exploitation and social exclusion, while simultaneously representing survival and historical continuity within a city repeatedly ravaged by political and communal violence. To the contrary, Dimple in Narcopolis reflects the postcolonial exhaustion and erasure, her life gradually consumed by addiction, abuse and structural neglect in a decaying metropolitan environment. The comparative analysis revealed a significant shift in the representation of marginalized women—from endurance and resilience in Singh's historical narrative to disposability and annihilation in Thayil's contemporary urban vision. The present research further critiques male narratorial authority in both novels, demonstrating how women's experiences are mediated through masculine perspectives that render them visible yet voiceless. Thus, by conceptualizing the city as a feminized body and women as alternative historians of urban suffering, this study fills a critical gap in existing scholarship. It contributes to Women Studies and Indian English fiction by foregrounding Bhagmati and Dimple as central figures through whom gendered marginality and urban violence are articulated in postcolonial literary narratives.

Tech-Enabled Inclusion: Transforming CWSN Pedagogy through UDL

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Abstract

As inclusive education becomes a global mandate, the challenge shifts from physical integration to pedagogical accessibility. This research study investigates the intersection of technological advancement and Universal Design for Learning (UDL) in teaching Children with Special Needs (CWSN) within inclusive school settings. While traditional "one-size-fits-all" curricula often marginalize neurodivergent learners and those with physical disabilities, modern assistive technologies—ranging from AI-driven speech-to-text to immersive VR environments—provide the flexibility required to meet UDL's three core principles: multiple means of representation, engagement and expression. This study evaluates the efficacy of adaptive digital interfaces in reducing learning barriers and enhancing student autonomy. Through a qualitative analysis of tech-integrated UDL frameworks, this research demonstrates that technology does not merely "assist" the student; it reconfigures the classroom environment to be inherently accessible. The findings suggested that when technological tools are mapped intentionally to UDL principles, CWSN exhibited higher engagement levels and improved learning outcomes, paving the way for a more equitable educational landscape.

Content Analysis on Portrayal of Police in Print Media through Newspaper

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Abstract

Despite doing the hardest jobs and offering assistance to public in a range of situations, police are often portrayed poorly in print media. Misrepresentation of law enforcement may obscure their significant contributions to community safety and order. As a result, public perception may shift, which might lead to a loss of trust and support to the law enforcement organizations that work so hard to protect and serve the society. However, positive representations may assist in the enhancement of public – police dynamics. This study aims to investigate and gain an understanding regarding the depiction of police image in the press narratives. Content analysis of 463 news items published during the last quarter (October 1 to December 31) of the year 2025 using data from Indian-origin English daily "Times of India", which has been selected based on the highest circulation ranking reported by India's Audit Bureau of Circulations (ABC). The coding protocol used for the data collection focused on descriptive details of the news item, incident characteristics and depiction of police image & tone of the news item. Either a word 'police' or 'cop' in the title of news item at the first level and repetition of same word at least three times in the content are searched to include the news item in the analysis process. Those excerpts that are not longer than two inches in length with incomplete details and do not depict any role of police are excluded. The outcomes of this research would be helpful to identify the journalistic framing of police.

Descriptive Analysis on Trends in Crimes Against Women in India Based on NCRB Statistics

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Abstract

Women are an integral part of society and every family. Although women are revered as goddesses in the scriptures, equality and dignity are emphasized in the digital age, a significant portion of women in India are subjected to oppression, discrimination abuse and violence in the male-dominated Indian society. Thus, crimes against women (CAW) in India continues to be a serious sociological and criminological concern. Also, most of the crimes committed against women are gender-based crimes. Therefore, it is crucial to understand the current trends such as whether these crimes are increasing or decreasing. The present study is a critical descriptive analysis in lieu of available data with regard to crimes against women in India over the past decade (2014-2023) using official crime statistics reports published by the National Crime Records Bureau of the Government of India. The main objectives of this study include analyzing the trend of crimes against women in India to examine the year-on-year changes in overall number of reported incidents. In furtherance, this study also aims to explore the relationship between crimes against women and certain socio-economic factors. Also, a comparative analysis based on the states of India has also been performed in this study. These findings have showed that women are not safe even in their own homes. Moreover, the data analysis of the past ten years revealed violence perpetrated by husbands or their relatives is the most prevalent crime committed against women. Also, the report indicated that recorded crimes against women have been steadily increasing over the past decade with domestic violence-related crimes constituting a large proportion of the total cases. Furthermore, based on the trends in crimes against women, Uttar Pradesh, Maharashtra, West Bengal and Rajasthan have been identified as the most unsafe states for women in India.

Procedural Integrity of Digital Evidence – A Comparison of Section 65B IEA with New BNSS and BSA Mandates

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Abstract

In the contemporary landscape characterized by digital exchanges and online engagements, the procedural soundness of digital evidence is paramount for upholding equitable trials and judicial efficacy within India. This comparative analysis investigates the progression from Section 65B of the Indian Evidence Act (IEA) of 1872, which initially provided the foundational structure for admitting electronic documents via obligatory certification to authenticate their validity and establish a chain of custody to the revised stipulations outlined in the Bharatiya Nagrik Suraksha Samhita (BNSS) 2023 and the Bharatiya Testimony Act (BSA) of 2023. Section 65B, while underscoring the necessity of a responsible officer's certificate to authenticate the provenance and reliability of electronic records and modifies sections 61–63 of BSA. This amendment provides a precise definition of electronic records, encompassing hash value verification and integrates forensic expert opinions in accordance with section 45A. Thus, it clarifies the uncertainties related to tampering detection and management of cross-border data. The BNSS further promotes transparency within criminal investigations through introduction of procedural safeguards in sections 176(3) and 105, specifically concerning digital searches, seizures and audio-video recordings. Nevertheless, difficulties do persist, including technical limitations in deepfake detection and resource constraints in forensic implementation. Consequently, this modification bolsters the credibility of digital evidence by establishing a more robust evidentiary framework, while simultaneously highlighting the necessity for ongoing judicial training and legislative adjustments to address the evolving cyber threats.

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