LAICSEE
12-13 JUNE 2025
LIMA, PERU

3rd Latin American International Conference on Sustainable Engineering and Education

LAICSEE-2025

12th & 13th June, 2025 | Lima, Peru

Organized by: IFERP Academy

IFERP® Academy
Explore Your Research Journey...

3rd Latin American International Conference on Sustainable Engineering and Education (LAICSEE-2025)

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Conference Theme:

“SUSTAINABLE INDUSTRIAL PRACTICES: **BRIDGING** THE GAP BETWEEN KNOWLEDGE **AND TECHNOLOGICAL INNOVATION”**

PREFACE

We are delighted to extend a warm welcome to all participants attending 3rd Latin American International Conference on Sustainable Engineering and Education (LAICSEE-2025), taking place in Lima, Peru on 12th & 13th June, 2025. This conference provides a vital platform for researchers, students, academicians, and industry professionals from all over the world to share their latest research results and development activities in the field of Sustainable Engineering and Education. It offers delegates an opportunity to exchange new ideas and experiences, establish business or research relationships, and explore global collaborations.

The proceedings for LAICSEE-2025 contain the most up-to-date, comprehensive, and globally relevant knowledge in the field of Sustainable Engineering and Education. All submitted papers were subject to rigorous peer-reviewing by 2-4 expert referees, and the papers included in these proceedings have been selected for their quality and relevance to the conference. We are confident that these proceedings will not only provide readers with a broad overview of the latest research results in Sustainable Engineering and Education but also serve as a valuable summary and reference for further research in this field.

We are grateful for the support of many universities and research institutes, whose contributions were vital to the success of this conference. We extend our sincerest gratitude and highest respect to the many professors who played an important role in the review process, providing valuable feedback and suggestions to authors to improve their work. We also extend our appreciation to the external reviewers for providing additional support in the review process and to the authors for contributing their research results to the LAICSEE-2025.

Since April 2025, the Organizing Committees have received a large volume of paper submissions covering diverse aspects of the conference themes. Following a thorough review process, a significant number of high-quality papers were selected for inclusion in the conference proceedings. We sincerely thank all participants for their valuable contributions. Our deep appreciation goes to the keynote speakers, session presenters, and all contributing authors for their commitment and dedication. Special thanks are also due to the technical program committee and reviewers for their vital role in upholding the quality of this event. Lastly, we express our heartfelt gratitude to the organizing committee for their tireless efforts in bringing LAICSEE-2025 to life.

ABOUT
LAICSEE – 2025

LAICSEE - Conference on Sustainable Engineering and Education brings together researchers, academics, professionals, and students to discuss and share advancements, research findings, and best practices in the field. Topics commonly covered include sustainable technologies, environmental impact assessments, renewable energy, green building design, eco-friendly materials, and innovative teaching methods, and more.

Scope of the Conference:

Potential authors and scholars feel encouraged to contribute by joining the international education conference through submissions of their unique research abstracts, papers, and presentations. This international conference invites everyone who wishes to learn, grow, and participate in topics related to sustainable engineering and education.

Objective of the Conference:

The ultimate goal is to contribute to conceptual and theoretical developments of education globally. At the core of LAICSEE 2025 lies the ambitious objective of synchronizing sustainable engineering, technology, and education on a unified platform. This engineering education conference Peru will offer a global opportunity for knowledge exchange, collaboration, paper submissions, networking, and innovation.

ABOUT IFERP

IFERP Academy is a non-profit professional association meant for research and development in Engineering, Science, and technology. With a global presence, IFERP is committed to advancing knowledge across diverse disciplines through international conferences, workshops, and scholarly publications. We provide help, assistance, and direction in preparation for SCI and SCIE journal publishing. These journals undergo a rigorous peer-review process to ensure quality publication. IFERP has established robust scientific, academic, and industry networks throughout Asia, the Middle East, and Europe.

Mission:

Upskilling the knowledge hub through technological innovation and excellence for the benefit of humanity.

Value:

IFERP values the restoration of high- level technological research, learning, collaboration, resource sharing & community-building traditions.

Vision:

A Digitally equipped robust, dynamic & swift professional community integrating academics & industry for upgraded technical knowledge implementation.

Goal:

To serve as the foundation for all technological progress and advancement activities around the world.

MESSAGE FROM
MANAGING DIRECTOR, IFERP

Mr. A. SIDDTH KUMAR CHHAJER

MD & Founder,
IFERP, Technoarete Group

On behalf of Institute For Educational Research and Publications (IFERP) & the organizing Committee, I express my hearty gratitude to the Participants, Keynote Speakers, Delegates, Reviewers and Researchers.

The goal of the 3rd Latin American International Conference on Sustainable Engineering and Education (LAICSEE-2025) is to provide knowledge enrichment and innovative technical exchange between international researchers or scholars and practitioners from the academia and industries in the field of Sustainable Engineering and Education .

This conference creates solutions in different ways and to share innovative ideas in the field of Sustainable Engineering and Education. LAICSEE-2025 provides a world class stage to the Researchers, Professionals, Scientists, Academicians and Students to engage in very challenging conversations, assess the current body of research and determine knowledge and capability gaps.

3rd Latin American International Conference on Sustainable Engineering and Education (LAICSEE-2025)will explore the new horizons of innovations from distinguished Researchers, Scientists and Eminent Authors in academia and industry working for the advancements in Sustainable Engineering and Education from all over the world. LAICSEE-2025 hopes to set the perfect platform for participants to establish careers as successful and globally renowned specialists in the field of Sustainable Engineering and Education.

MESSAGE FROM
CHIEF EXECUTIVE, IFERP

MR. RUDRA BHANU SATPATHY

CEO & Founder,
IFERP, Technoarete Group

IFERP is hosting the 3rd Latin American International Conference on Sustainable Engineering and Education (LAICSEE-2025) this year in month of 12th & 13th June 2025, Lima, Peru. The main objective of LAICSEE-2025 is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The sessions serve as an excellent opportunity to soak up information from widely respected experts.

Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and become known as a thought leader. I express my hearty gratitude to all my Colleagues, Staffs, Professors, Reviewers and Members of Organizing Committee for their hearty and dedicated support to make this conference successful. I am also thankful to all our delegates for their pain staking effort to make this conference successful.

Guest of Honour

Dr. Jesus Otto Villanueva Napuri, MSc.

Professor, Former Director of the Schools of Telecommunications Engineering and Electronic Engineering, Universidad Nacional Mayor de San Marcos, Former Vice President of the Supervisory Agency for Private Investment in Telecommunications - OSIPTEL

Experienced academic and telecommunications expert. Associate Professor at the National University of San Marcos (UNMSM) and former Vice President of the Board of Directors of OSIPTEL (the Regulatory Agency for Private Investment in Telecommunications, Peru). He was a Full Member of the AHCIET Committee (currently ASIET). He completed his PhD in Industrial Engineering and holds a Master's degree in Regulation of Public Telecommunications Services and another in Business Administration. He has extensive professional experience in managerial and executive positions in companies in the telecommunications sector, in strategic planning, quality assurance, and public service regulation.

BIOGRAPHY OF
KEYNOTE SPEAKER

Dr. Anand Nayyar

Full Professor, Scientist, Vice-Chairman (Research) and Director- IoT and Intelligent Systems Lab, School of Computer Science,Duy Tan University, Da Nang, Vietnam

Dr. Anand Nayyar received Ph.D (Computer Science) from Desh Bhagat University in 2017 in the area of Wireless Sensor Networks, Swarm Intelligence and Network Simulation. He is currently working in School of Computer Science-Duy Tan University, Da Nang, Vietnam as Professor, Scientist, Vice-Chairman (Research) and Director- IoT and Intelligent Systems Lab. A Certified Professional with 250+ Professional certifications from CISCO, Microsoft, Amazon, Alibaba Cloud, Oracle, Google, Beingcert, EXIN, GAQM, Cyberoam and many more. Published more than 200+ Research Papers in various High-Quality ISI-SCI/SCIE/SSCI Impact Factor- Q1, Q2, Q3, Q4 Journals cum Scopus/ESCI indexed Journals, 80+ Papers in International Conferences indexed with Springer, IEEE and ACM Digital Library, 60+ Book Chapters in various SCOPUS/WEB OF SCIENCE Indexed Books with Springer, CRC Press, Wiley, IET, Elsevier with Citations: (Google Scholar): 17700+, H-Index: 69 and I-Index: 280; (Scopus): 9500+; H-index: 52. Member of more than 60+ Associations as Senior and Life Member like: IEEE (Senior Member) and ACM (Senior Member). He has authored/co-authored cum Edited 60+ Books of Computer Science.

Associated with more than 600+ International Conferences as Programme Committee/Chair/ Advisory Board/Review Board member. He has completed 1 Grassroot and 1 ASEAN Project. He has 18 Australian Patents, 16 German Patents, 4 Japanese Patents, 43 Indian Design cum Utility Patents, 13 UK Patents, 1 USA Patent, 3 Indian Copyrights and 2 Canadian Copyrights to his credit in the area of Wireless Communications, Artificial Intelligence, Cloud Computing, IoT, Healthcare, Drones, Robotics and Image Processing. Awarded 54 Awards for Teaching and Research—Young Scientist, Best Scientist, Best Senior Scientist, Asia Top 50 Academicians and Researchers, Young Researcher Award, Outstanding Researcher Award, Excellence in Teaching, Best Senior Scientist Award, DTU Best Professor and Researcher Award- 2019, 2020-2021, 2022, 2022-2023, 2023-2024, Distinguished Scientist Award by National University of Singapore, Obada Prize 2023, Lifetime Achievement Award 2023, 2024; Asian Admirable Achievers 2024; Distinguished Academic Leader 2024, Lifetime Achievement Award 2024 and many more. He is listed in Top 2% Scientists as per Stanford University (2019, 2020, 2021, 2022, 2023), Ad Index (Rank No:1 Duy Tan University, Rank No:1 Computer Science in Viet Nam) and Listed on Research.com (Top Scientist of Computer Science in Viet Nam- National Ranking: 2; D-Index: 42; World Ranking: 6968). He is acting as Associate Editor for Computer Communications (Elsevier), International Journal of Sensor Networks (IJSNET) (Inderscience), Computers Materials and Continua (CMC), Tech Science Press- IASC, Cogent Engineering, Human Centric Computing and Information Sciences (HCIS), PeerJ Computer Science, IET-Quantum Communications, IET Networks, IEEE Transactions on Artificial Intelligence (IEEE TAI), Indonesian Journal of Electrical Engineering and Computer Science, IJFC, IJISP, IJDST, IJCINI, IJGC, IJSIR, IJBDCN, IJNR, IJSI, IJIES. He is acting as Managing Editor of IGI-Global Journal, USA titled "International Journal of Knowledge and Systems Science (IJKSS)" and Editor-in-Chief of IGI-Global, USA Journal titled "International Journal of Smart Vehicles and Smart Transportation (IJSVST)". He has reviewed more than 5100+ Articles for diverse Web of Science and Scopus Indexed Journals. He is currently researching in the area of Wireless Sensor Networks, Internet of Things, Swarm Intelligence, Cloud Computing, Artificial Intelligence, Drones, Blockchain, Cyber Security, Healthcare Informatics, Big Data and Wireless Communications.

BIOGRAPHY OF
KEYNOTE SPEAKER

Dr. Girijesh Prasad

Professor of Intelligent Systems, School of Computing, Engineering and Intelligent Systems, University of Ulster United Kingdom

Prof. Girijesh Prasad is Professor of Intelligent Systems in the School of Computing, Engineering and Intelligent Systems, Ulster University (UU), UK. He is Director of Northern Ireland Functional Brain Mapping (NIFBM) facility at UU's Intelligent Systems Research Centre (ISRC), where he leads the Cognitive Neuroscience and Neurotechnology research team. He received a BTech in Electrical Engineering from Regional Engineering College (now National Institute of Technology) Calicut, India in 1987, an MTech in Computer Science and Technology from University of Roorkee (now Indian Institute of Technology Roorkee), India in 1992, and a PhD in Electrical Engineering from Queen's University of Belfast, UK in 1997. He is a Chartered Engineer, a Fellow of IET, a Fellow of Higher Education Academy, a Senior Member of IEEE, and a founder member of IEEE Systems, Man, and Cybernetics society's Technical Committee on Brain-Machine Interface Systems. In 2017, he was awarded the Fellowship of International Academy of Physical Sciences and the Senior Distinguished Research Fellowship of Ulster University. Prof. Prasad joined Ulster University, as a Lecturer in 1999; he was promoted to Senior Lecturer in 2007, Reader in 2008, and Professor in 2011. Previously he worked in industry first as a Digital Systems Engineer and then as a Power Plant Engineer in India, and as a Research Fellow on an EPSRC/industry project at Queen's

University of Belfast, UK. His research interests are in intelligent systems, data engineering, brain modelling, brain- computer interface (BCI) & neuro-rehabilitation, and assistive technology. Under his supervision, an advanced rehabilitation protocol has been developed incorporating an active physical practice stage followed by a mental practice stage, using a neuro-rehab system consisting of a robotic hand exoskeleton and an EEG/EEG-EMG based BCI, which has been trialled on groups of chronic stroke patients in UK as well as India, resulting in transformative change in patients' quality of life. He has published over 285 research papers in journals, edited books, and conference proceedings. He has supervised to completion 22 PhD students. His research has attracted 18 research grant awards amounting to over £10M funding from national and international agencies including Invest Northern Ireland, Department of Employment and Learning, Research Councils UK (RCUK), Leverhulme Trust, Royal Society, UK India Education and Research Initiative (UKIERI), UK Research and Innovation (UKRI) and Irish industry.

BIOGRAPHY OF
KEYNOTE SPEAKER

Dr. Ts. Suresh Gobee

Head of Asia Pacific Center of Robotics Engineering (APCoRE), Senior Lecturer, Asia Pacific University of Technology and Innovation (APU / APIIT), Malaysia

Ts. Suresh Gobee is a Senior Lecturer and the Head of the Asia Pacific Centre of Robotics Engineering (APCoRE) at Asia Pacific University of Technology & Innovation (APU) in Kuala Lumpur, Malaysia. His research focuses on robotics, automation, mechatronics, medical robotics, human-robot interaction, and brain-inspired computing, with a strong emphasis on assistive technologies designed to improve the lives of individuals with disabilities. He has co-authored 35 publications and contributed to groundbreaking projects such as soft-exoskeletons for finger rehabilitation, assistive wearables for the visually impaired, and intelligent autonomous wheelchair systems. His work has gained international recognition, leading APU student teams to major victories, including World of Robotics Championship (WRC) 2023 and Robot Challenge 2024 in Beijing. In addition to his academic and mentorship achievements, Ts. Suresh Gobee played a key role in securing the Erasmus+ Grant (2024) for a transformative agricultural project — reflecting his commitment to driving impactful, real-world innovation.

KEYNOTE SPEAKER

Carlos Sotelo-López

PhD in Electrical Engineering, Past Vice Minister of Communications of Peru Advisor to the Vice Rectorate for Research and Graduate Studies at UNMSM, Peru

BIOGRAPHY OF
KEYNOTE SPEAKER

Mr. Mesías Guevara
Senior Executive, Peruvian, Peru

Mr. Mesías Guevara is a distinguished Peruvian engineer, senior executive, and thought leader with a diverse background in technology, governance, and academia. He holds degrees in electronic engineering from Ricardo Palma University and business administration from ESAN. Throughout his career, he has held key leadership roles in the telecommunications sector, focusing on digital infrastructure, connectivity, and innovation.

In public administration, he has contributed to national development through various leadership positions, advocating for digital transformation, education, and sustainable development. Beyond his executive and public service roles, Mr. Guevara has remained committed to academic growth, teaching, and research in areas that bridge technical expertise and public policy.

His ongoing work continues to promote the integration of engineering and strategic planning for inclusive, forward-thinking progress in Peru.

BIOGRAPHY OF
KEYNOTE SPEAKER

Dr. Jose Luis Solis Veliz

Professor, Director de Centro de Energias Renovables (CER) Professor Principal, Universidad Nacional de Ingeniería, Peru

José L. Solís obtained his Bachelor, Master and Doctor degrees from the National University of Engineering, in 1987, 1995 and 1997, respectively. The doctorate was obtained in cooperation with the University of Oulu, Finland. He has done postdocs at University of Oulu, Finland (1998), Uppsala University, Sweden (2000), and the Texas A & M, United States (2002). In 1998 he received the Young Researcher in Physics Award from the National Academy of Science and Technology (Peru) and The Third World Academy of Science (TWAS). He has been a principal investigator of several projects funded by CONCYTEC (Peruvian National Science Foundation) and has participated in international research projects. In December 2010 he has been incorporated as a Titular Member to the Academy of Sciences of Peru. He has more than 75 articles in international journals and is reviewer of several journals. In 2014 he was part of the team that won the Graña & Montero Prize for Engineering Research. He is currently a full Professor at the Faculty of Sciences of the National University of Engineering, during 2014 and 2016 was the Head of the National Program of Science, Technology and Innovation of Materials for Industrial Competitiveness.

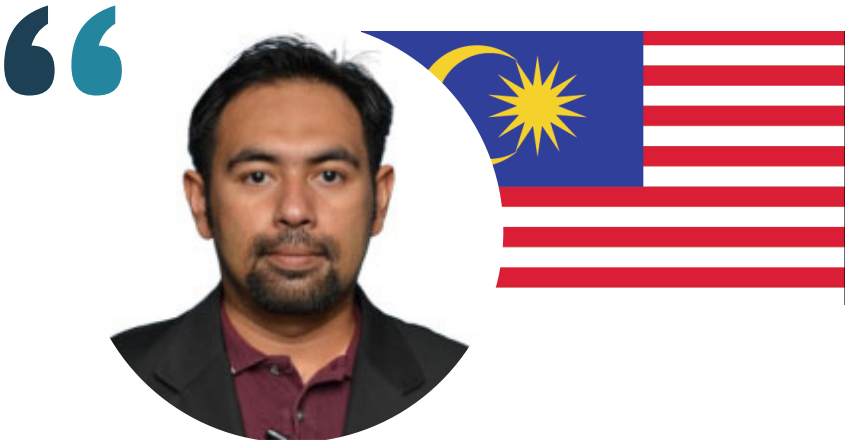
BIOGRAPHY OF
SESSION SPEAKER

Ir. Dr. Mohammed Alias Yusof

Professor, Department of Civil Engineering, National Defense University of Malaysia, Sungai Besi Military Camp, Malaysia

Ir. Dr. Mohammed Alias Yusof is a Professor in the Department of Civil Engineering, Universiti Pertahanan Nasional, Malaysia. He graduated with B. Eng (Hons) degree in Civil Engineering from Universiti Teknologi Malaysia (UTM) in 2002, a MSc. degree in Integrated Construction Project Management from Universiti Teknologi Mara (UiTM) in 2005 and PhD degree in Civil Engineering from Universiti Pertahanan Nasional Malaysia in 2013. He is a Professional Engineer registered with the Board of Engineer Malaysia. His main research interests are in the blast resistant materials such as concrete, glass, and also military and commercial explosives. He has developed a blast resistant concrete and had obtained the patent for the blast resistant concrete panel from Intellectual Properties Corporation of Malaysia (MyIPO) in 2016. Dr Mohammed Alias Yusof is author of " Blast Resistant Materials : Concrete and Glass", book. This book focus on the introduction to explosive technology, blast phenomena, blast resistant concrete and glass. Dr. Mohammed Alias has published extensively in the areas of blast resistant materials and technology, with a total publication count of more than 100, has served as reviewer for prestigious journals Science and Technology Journal. In 2024, he has been awarded a Distinguish Reseacher by Venus International Foundation, Chennai, India for his valuable contribution in the field of blast resistant materials and civil Engineering. Area of expertise: Concrete technology,glass, structural, construction project management, sustainable development goal.

BIOGRAPHY OF
SESSION SPEAKER

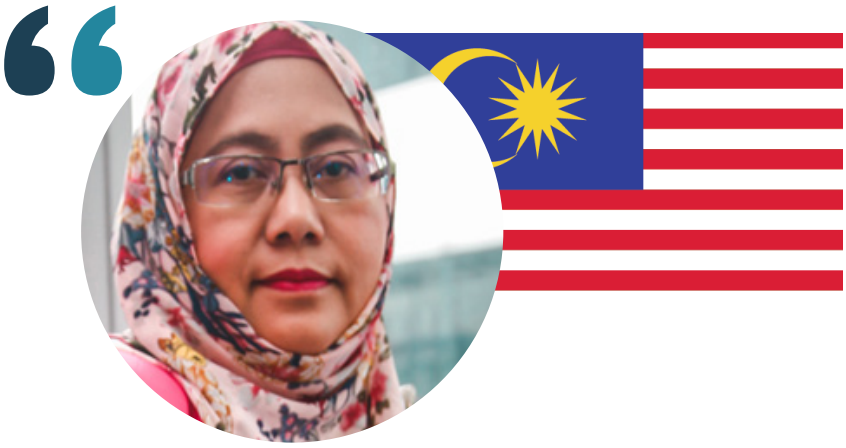


Dr. Mohd Fathi Abu Yaziz

Associate Professor, Universiti Teknologi MARA, Malaysia

Dr. Mohd Fathi brings over 15 years of real-world experience to the table. Prior to his distinguished academic career, he rose to the Director level in logistics, providing solutions for major clients like KFC, Pizza Hut, and Cadbury Malaysia. This experience grants him a unique understanding of the challenges and opportunities facing today's businesses. Dr. Fathi now leverages his expertise at the Arshad Ayub Graduate Business School at Universiti Teknologi MARA (UiTM). Previously, he served as Deputy Dean of the Malaysian Graduate School of Entrepreneurship and Business (MGSEB) at UMK. He holds a Ph.D. in Technology, Operation and Logistics Management, along with an MBA, both from Universiti Utara Malaysia. His passion for knowledge extends to his prolific research and publications in areas like Operations Management, Logistics, and Supply Chain Innovation. Dr. Fathi is a sought-after thought leader, frequently invited as a keynote speaker at regional conferences. He actively contributes to Malaysia's progress, having directly trained public service staff and played a key role in developing the nation's digital logistics roadmap. His valuable insights have also benefited the Malaysian Productivity Council in their efforts to enhance national process efficiency. Dr. Fathi is deeply passionate about developing the next generation of global leaders. He believes success hinges on strong values, integrity, continuous learning, and dedication. His vision extends beyond classrooms, aiming to establish universities as prominent hubs for global education. He sees international collaboration and strong networks as key to achieving this goal.

BIOGRAPHY OF
SESSION SPEAKER



Dr. Cordelia Mason
Professor of Management & Entrepreneurship
Universiti Kuala Lumpur, Malaysia

Cordelia Mason is a professor in management and entrepreneurship. A self-professed informal knowledge-broker, Cordelia enjoys exploring the meanings of life across geographical, social and economic boundaries using the lenses of strategic management, innovation and social entrepreneurship. She is deeply inspired by the diverse social missions which have been emerging strongly across industries and see some ray of hope for sustainability.

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Abstract's Index

Abstracts

Sustainable Vernacular Identity Through Timeline Case Study Uzbekistan Resorts

Nisreen Samy Abdeen
Architecture and Design, Central Asian University, Uzbekistan

Array
Architecture and Design, Central Asian University, Uzbekistan

Abstract:

Sustainability is a part of cultural identity, as it is a holistic composition of both tangible and intangible resources. Sustainability in heritage was known by its passive system in emerging natural environment as cultural theme that creates optimum relation between people and nature of place. This paper aims to redefine the priority of local identity as emergence for societies and how to integrate with the concept of globalization in implementing sustainability in heritage without losing its identity as cultural value in regions. The research methodology is based on analysis for Uzbekistan heritage identity and its relation with identity and how to be merged sustainability as stereotype patterns based on qualitative and quantitative analysis in architectural design studio.

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Development of a Tribological System Toward Reducing the Environmental Impact of Mechanical Components Used in Heavy Machinery

Fabio Ferreira
Mechanical Engineering, University of Coimbra, Portugal

Takeru Omiya
Mechanical Engineering, University of Coimbra, Portugal

Abstract:

The integration of metallic elements into diamond-like carbon (DLC) coatings, particularly cobalt (Co-DLC), has attracted significant attention for enhancing functionalities in various applications. This study explores the interaction between functionalized polymers and Co-DLC coatings to elucidate their tribological properties and wear resistance. Co-DLC coatings were deposited on steel substrates using deep oscillation magnetron sputtering, and different Co concentrations were achieved by varying cobalt pallets. Tribological tests were conducted using ball-on-disk tribometry, revealing reduced friction and improved wear resistance of Co-DLC coatings when paired with PLMA-b-PDMAEMA polymer compared to PLMA. Surface characterization through SEM-EDS analysis unveiled the formation of transfer films derived from carbon-rich polymers, contributing to the observed reduction in wear rates. Overall, Co-doped DLC coatings exhibited promising potential in mitigating friction and enhancing wear resistance when combined with specific functionalized polymers, indicating avenues for diverse industrial applications. This comprehensive investigation not only advances the understanding of tribological behavior but also facilitates the development of tailored materials with superior performance in real-world applications.

Keywords:

Copolymer, Sliding friction, DLC coatings.

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Performance Analysis of CrAlNAg-coated Inserts with Variable Silver Content in Roughing and Finishing Face Milling Operations

Filipe Fernandes
Mechanical Engineering, ISEP - Polytechnic of Porto, University of Coimbra, Portugal

Sumit Singh Rajput
Mechanical Engineering, ISEP - Polytechnic of Porto, University of Coimbra, Portugal

Abstract:

The research evaluated the performance of a novel hard solid lubricant coating, CrAlNAg, during face milling of AISI 1045 medium-carbon steel under roughing and finishing conditions. Dry machining tests were conducted using CrAlN-coated inserts with varying silver (Ag) contents ranging from 0 to 16 at.%. The goal was to assess the effectiveness of these coatings in achieving (a) high material removal rates during rough machining and (b) enhanced surface finish and dimensional accuracy during finish machining.

Cutting forces were analyzed in detail to determine the coating's influence under these conditions. A cutting forces were acquired with a 3 axis dynamometer during machining. These forces were further resolved into true cutting force components based on tool geometry and mathematical calculations, identifying the most sensitive force components with respect to cutting parameters.

In addition to cutting forces, other performance metrics such as chip temperature, tool wear, surface roughness, and chip morphology were evaluated for various coating compositions across the two machining modes. Among the tested coatings, CrAlNAg9, with approximately 8.6 at.% Ag, demonstrated superior adhesion to the substrate and excellent tribological properties. This coating significantly reduced dominant cutting forces and chip temperature while providing exceptional resistance to flank wear, outperforming other CrAlNAg compositions.

Keywords:

CrAlAgN thin films, Dry machining, FE simulations.

ISBN: 978-93-92104-36-7

Kanban Design and Implementation to Reduce Costs in a SME Fragance Producer

Marco Antonio Diaz Diaz
Facultad de Ingenieria, Universidad Privada del Norte Peru, Lima, Peru

Renato Romero Castillo
Facultad de Ingenieria, Universidad Privada del Norte Peru, Lima, Peru

Caleb Alburqueque Rueda
Facultad de Ingenieria, Universidad Privada del Norte Peru, Lima, Peru

Kelly Polo Herrera
Facultad de Ingenieria, Universidad Privada del Norte Peru, Lima, Peru

Abstract:

The application of Lean methodologies is widely recognized for optimizing workflow, ensuring production efficiency, and minimizing costs. While methodologies such as Kanban have proven effective across various industries, their application in fragrance microenterprises remains largely unexplored. This study aims to assess the impact of the Kanban methodology on cost reduction in a fragrance-producing microenterprise by developing a replicable model. By applying realistic constraints to select the optimal alternative, followed by its design and implementation, the findings indicate a significant improvement in operational efficiency of 10.65%. Additionally, the reduction in opportunity costs resulted in a profit increase of $5,953.25. Furthermore, financial indicators, including a net present value (NPV) of $264.82 and an internal rate of return (IRR) of 16.20%, confirm the financial viability of the proposal. This study contributes to the adoption of Lean methodologies in resource-constrained microenterprises by providing a practical and effective approach to process improvement.

ISBN: 978-93-92104-36-7

Analysis of the Economic and Environmental Potential of Wind Energy Use as an Alternative Source in the Peruvian Mining Industry

Marco Antonio Diaz Diaz
Facultad de Ingenieria, Universidad Privada del Norte Peru, Lima, Peru

Kelly Milena Polo Herrera
Facultad de Ingenieria, Universidad Privada del Norte Peru, Lima, Peru

Abstract:

Mining is a key economic activity in many countries. However, its high energy consumption and environmental impact raise significant concerns. This study evaluates the feasibility of adopting wind energy as an alternative to conventional energy sources in the Peruvian mining industry. A quantitative approach was employed using a descriptive, non-experimental design to analyze the costs and benefits of this transition and compare greenhouse gas (GHG) emissions from both energy sources. The findings indicate that implementing wind energy presents a significant opportunity for long-term reductions in investment, operational, and maintenance costs. Projections estimate that the San Juan de Marcona wind farm in Peru would require an investment of $342 million, while the Punta Lomitas wind farm would demand $570 million over the same period. Comparatively, electricity costs for mining companies are projected to range between $175.99 million and $2.87 billion over 30 years. Furthermore, the transition to wind energy could reduce between 662,515.2 and 5,999,443.2 tons of CO_2-equivalent emissions over three decades. These findings demonstrate that wind energy is not only an economically viable alternative for the mining sector but also a sustainable solution that contributes to environmental protection and the transition to a cleaner economy.

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Artificial Intelligence and Workplace Stress: Analysis from a Documentary Perspective

Adrian Marcel Garcia Caicedo
Bogota, Corporación Universitaria Minuto de Dios - UNIMINUTO, Colombia

Cristian Camilo Osorio Ordoez
Bogota, Corporación Universitaria Minuto de Dios - UNIMINUTO, Colombia

Abstract:

Artificial intelligence (AI) has seen rapid development and has become widely used in various fields, including the workplace. This study focuses on investigating the possible repercussions of AI on workers' mental health, specifically in relation to work stress. Using a documentary review methodology, exhaustive searches were carried out in academic databases with key terms related to AI and work stress. The results revealed that the implementation of AI can have both positive and negative effects on workers' stress level.

AI can reduce workload, improve efficiency and free employees from routine tasks, contributing to psychological well-being by reducing pressure and burnout. However, negative effects were also identified, such as generating uncertainty among employees due to a lack of understanding of how algorithms and decision-making work. Additionally, there are concerns that AI could replace jobs, increasing feelings of job insecurity. AI can significantly influence workplace stress, making it crucial to understand and address these effects to leverage its benefits effectively in work environments.

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Forest Zoning in the Peruvian Amazon: Strategies to Mitigate its Environmental Impacts and Strengthen Environmental Governance in Peru

Iselli Josylin Nohely Murga Gonzalez
Universidad Privada del Norte Peru, Lima, Peru

Nicholas Barboza
Universidad Privada del Norte Peru, Lima, Peru

Maritza Minaya
Universidad Privada del Norte Peru, Lima, Peru

Pierre Velazco
Universidad Privada del Norte Peru, Lima, Peru

Sara Naupari
Universidad Privada del Norte Peru, Lima, Peru

Kelly Polo
Universidad Privada del Norte Peru, Lima, Peru

Abstract:

Deforestation and forest degradation in the Peruvian Amazon have caused significant environmental impacts, affecting biodiversity, water resources, and soil stability. However, current legislation has gaps that limit the State's ability to effectively manage forest resources and mitigate these impacts. This study analyzes Law No. 31973, which amends Law No. 29763, the Forest and Wildlife Law, and approves complementary provisions aimed at forest zoning, comparing Peruvian environmental legislation with the regulations of other countries that have achieved effective forest management to identify best practices applicable to Peru. A systematic review of scientific literature and international legislation was conducted using databases such as Redalyc, Scopus, and Google Scholar, with keywords related to deforestation and environmental laws. The results showed that Law No. 31973 weakened forest management by eliminating land classification and restricting the State's capacity to restore degraded areas. In contrast, Brazil, Guatemala, and Costa Rica have implemented effective strategies, such as economic incentives for conservation (PSA in Brazil, PINFOR in Guatemala), environmental monitoring (CAR in Brazil), and reforestation programs, while India and Sweden stand out for their focus on community participation and sustainable reforestation regulations. It is concluded that Peru could adapt these practices to close legal gaps and promote sustainable development, aligning itself with international commitments on sustainability and climate change, thus fostering responsible environmental management.

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Formulation of Sustainability Strategies for Extensive Cattle Ranching and Mitigation of its Environmental Impacts in the Department of Santander, Colombia

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Abstract:

xtensive cattle ranching has been identified as an economic activity of great impact, although with needs to mitigate its environmental impacts, in search of its sustainability. This qualitative research, with a descriptive and analytical documentary methodology, explores the production conditions and environmental impacts, especially on the soils of the department of Santander in Colombia, in order to identify and document sustainable production alternatives. The predominant practices and main characteristics of extensive cattle raising in the region were identified, highlighting the use of grass monocultures, the absence of pasture rotation and the lack of tree cover; at the same time, the existence of sustainable alternatives was documented, including silvopastoral systems and rotational grazing, which improve soil fertility and reduce erosion; This led to the formulation of improvement strategies with a focus on sustainability, based on training and awareness of the economic and environmental benefits of sustainable practices; the proposal of economic incentives for the implementation of systems and appropriation of technologies; and the creation of cooperation and technical support networks, impact indicators were defined and follow-up mechanisms were designed to evaluate the effectiveness of the strategies in reducing environmental impacts and improving livestock productivity.

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Evaluation of the Efficiency of a Fog Trap System for Water Use in the Villa Luz Farm, Caragua Alto Village, Municipality of Tona, Santander

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Abstract:

Water scarcity is a problem that affects several regions of the world, this has motivated the exploration of new options to contribute effectively to solve problems, the technology of fog catchers that facilitate the capture and use of water contained in the fog, promising to be a sustainable and environmentally friendly system. The main objective is to determine the efficiency of this system in a specific place. A prototype of a two-dimensional fog catcher with Raschel mesh was implemented, which generated a runoff of water conducted through pipes to storage tanks. The work was carried out at the Villa Luz farm in the Caragua Alto district of the municipality of Tona. The atmospheric conditions were evaluated together with the anthropic interventions that occurred at the site by means of the reports made by the Corporación Autónoma Regional para La Defensa De La Meseta De Bucaramanga (Regional Autonomous Corporation for the Defense of the Bucaramanga Plateau). Monitoring was carried out for 35 days, and data was collected on water catchment in millimeters per day, which allowed establishing an efficiency of 4148 ml.

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Conceptual Engineering Design of the Green Hydrogen Production Process as a Mechanism to Contribute to the Carbon Neutrality Strategy in Colombia

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Abstract:

Due to the need to contribute to sustainable development, considering that one of its pillars is climate change mitigation, this study aimed to identify the technologies associated with green hydrogen production for their implementation in the energy transition. The goal was to develop a conceptual design including each of the unit operations required in the synthesis process. A water electrolysis system was designed, selecting the alkaline electrolyzer as the best option due to its maturity. A calculation basis of 20 kg of daily hydrogen production was used, estimating an electrical energy requirement of 9,170 kWh and a water flow rate of 300 L/day to feed the electrochemical unit. NaOH and/or KOH were chosen as electrolytes due to their potential to conduct electricity. To ensure green production, coupling with a photovoltaic system is proposed as a renewable electrical energy source. The required power to guarantee the electrolyzer's 24-hour/day operation was evaluated using the Photovoltaic Geographical Information System software, based on the reference value corresponding to the estimated generation capacity of the Solar Barranca project, located in the municipality of Barrancabermeja, Santander. To determine the electrolyzer's power, the hourly hydrogen production was calculated based on demand and operating time, yielding a result of 0.833 kg of H_2/h. Finally, the required power was determined to be 46.296 kW. Additionally, it can be concluded that by installing a capacity to store 20 kg of H_2 daily at 500 bar of pressure, an equilibrium pressure of 286 bar is reached, and 7.09 kg of H_2 would be released due to the pressure difference.

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Environmental Education as a Fundamental Pillar in the Sustainable Management of Solid Waste: An Integrative Approach for Social and Environmental Change

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Abstract:

In a world in which the generation of solid waste increases by leaps and bounds, the proper management of this waste translates into a decisive challenge for society. The lack of environmental awareness, the excessive generation of garbage, its inadequate management and final disposal, negatively impact the environment and public health. In this context, environmental education emerges as a necessary tool to promote sustainable practices and promote a paradigm shift in the society-environment relationship. The methodology used in the research was descriptive with a qualitative approach, under a deductive method, in which an exhaustive bibliographic review was carried out in scientific databases, using key words such as "environmental education", "waste management", "sustainability " and "behavior change." Published articles were chosen that strictly analyzed the topic and provided empirical evidence on the impact of environmental education on waste management. The review of the information demonstrated a consensus on the importance of environmental education as a differentiating element for effective and sustainable waste management. The studies analyzed highlight, among other benefits, the promotion of social responsibility, greater environmental knowledge and awareness, and the adoption of responsible habits. It is concluded that environmental education is a transcendental pillar for effective and sustainable waste management. Its implementation in different contexts is crucial to encourage behavioral change, promote citizen participation and build a more environmentally responsible society.

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Mathematical Modeling and Analysis of the Drying Curve in Amaranth: Evaluation of Functional Properties

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Abstract:

The use of mathematical models to understand the dehydration of amaranth improves the efficiency and quality of drying, benefiting costs, sustainability, and product innovation. The main objective was to validate different mathematical models that accurately describe the drying process, allowing the determination of the kinetic and thermodynamic parameters that govern it, as well as the physicochemical and functional characteristics of the resulting amaranth flour. The experimental study was conducted using amaranth inflorescences (with seeds) grown in the Ica region, Peru, and subjected to drying temperatures of 60, 70, and 80 °C. Five mathematical models were applied to model the drying kinetics, with the Midilli model being the one that best adapted to the experimental curves, demonstrating precision in representing the drying curve of amaranth flour. On the other hand, lower moisture percentages (9.09 ± 0.15%) and water activity (0.45 ± 0.00) were found when the drying temperature was 80 °C, and the obtained flour showed a remarkable water retention capacity, while the emulsifying capacity showed its highest value in the flours obtained at 70 and 80°C. These findings

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underscore the importance of selecting the drying temperature properly in the production process of amaranth flour, as it can significantly influence its physical and functional properties, which in turn impacts its suitability as a functional ingredient for formulating various types of foods.

Keywords:

Mathematical modeling, drying kinetics, Amaranth flour, Functional properties, drying temperature.

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A Magical Journey from India to Guatemala and How Indigenous Women are Electrifying the Rural Mayan Landscape

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Abstract:

Barefoot Latin America Association as an institution was created in Guatemala in April 2022 in order to decentralize Barefoot College headquarters from India to Latin America. After a long journey of seven years overpassing obstacles, bureaucracy, lack of support from National Governments and private sector, this institution located in a tiny village -Batzul-, in the highlands of the country have been trained illiterate and semi-illiterate indigenous rural women as solar engineers. They got back to their villages to electrify households, bring access to light first time ever and generate a huge air of hope, autonomy, resilience and adaptation to Climate Change.

Barefoot Latin America Association operates based on gandhian principles from India, such as: solidarity, empathy, commitment, trust and transparency. Our methodologies allow us to exchange knowledge between India and Guatemala and to adapt programs and projects to the local mayan ecosystem. It's a great example about how a global initiative could be re-organize and connect with local realities and to keep the essence, spirit and good practices from rural India to rural Guatemala.

Today, more than 10,000 indigenous people are beneficiaries in the most isolated villages in Guatemala located in departments under extreme poverty as Quiché, Alta Verapaz, Huehuetenango. The Institution have received the Environmental Presidential Award by December 2022, and the Humanizing Energy Award from The World Energy Council by April 2024.

The next step and objective are to expand our coverage to other countries in Latin America, opening center's doors to students and rural women from any village across the continent whom are surviving without energy and light.

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Models of Robots That Collect Pet, Can and Tetra Pack Made with Urban Solid Waste and Propose by Students of Technical Career

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Abstract:

The National Polytechnic Institute (IPN) of Mexico is a leading institution in technological education and sustainable education in its community is part of its institutional development plan. The objectives were: 1) To design a robot to collect PET, Tetra pack and can in the school, 2) to induce students to research. The active didactic strategy of project-based learning (PBL) was applied to a group of 45 students of the Industrial Processes Technical career. The group was divided into teams to propose models of urban solid waste collection robots, them were built with recycled materials. This activity induces students to manage information, creative and to be interested in research. The students proposed 4 models, which can be brought to reality. Sustainability considers the environmental, social and economic factors. In the new generations, sustainable education must be strengthened, and actions must be carried out to care for the environment. SIP20241998 "Wili robot, technology in support of environmental care" and 20251232 "Design of a robot that collects PET, can and Tetra pack, technology in support of environmental care in CECYT 11 sustainable school, IPN.

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LxC Governance Framework: Strategic Regeneration of Life and Value

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Abstract:

This article introduces the *Regenerative Governance Framework via LxC (Life per Carbon)*—a scientifically grounded and engineering-based strategy for converting captured carbon dioxide and solar energy into structured living biomass with measurable multi-capital value. Rooted in the IP.IDEAS.S framework, this approach operationalizes the CRPC (Carbon Regenerative Physico-Chemical Cycle), whose governing equivalence is defined as L = C + 6.5 kWh/kg, where L is regenerated life, C is the amount of captured CO_2 (kg CO_2-eq), and 6.5 kWh/kg is the solar energy required to synthesize one kilogram of usable biomass. Unlike Elkington's Triple Bottom Line, the LxC model goes beyond ESG reporting by embedding physico-chemical traceability, exergetic logic, and verifiable regeneration into the strategic and operational design of sustainability processes. Its integrated methodological architecture includes DPAV (Decide, Plan, Act, Value) as a strategic governance cycle under uncertainty; CUPA (Calculate, Understand, Plan, Act) as the operational core; GETES as a multiactor system for ecological, technological, economic, and scientific integration; and the 9SP canvas of Nine Strategic Pillars for systemic design and evaluation. The framework employs performance indicators such as Regenerative Operational Performance (ROP), Marginal Benefit (BM), Marginal Consumption (CM), and Total Factor Productivity (PTF), alongside dynamic tools like Markov chain simulations and Leontief input–output matrices. Validated in the Peruvian Amazon (1977–2024), LxC demonstrates the viability of redesigning territorial development through regenerative engineering, collaborative governance, and thermodynamically grounded, multicapital value creation.

Keywords:

LxC Regenerative Engineering, CPRC, DPAV-CUPA, 9SP Strategic Participatory Framework, ETESG Participatory Regenerative.

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