Organized by : UNIVERSITAS KRISTEN MARANATHA

Book of Abstract Conference Proceeding

2nd ICISETIM

The 2nd International Conference on Industrial and Systems Engineering, Technology, Innovation, and Management

Hybrid Conference: **24-25 September 2024**
Venue: Swiss-Belhotel Rainforest Kuta, Bali, Indonesia

Theme: "New Approach after the Pandemic for Everyday Life"

https://icisetim.com

Book of Abstract Conference Proceeding

The 2nd International Conference on Industrial and Systems Engineering, Technology, Innovation, and Management (2nd ICISETIM)

Theme: “New Approach after the Pandemic for Everyday Life”

Hybrid International Conference
Swiss-Belhotel Rainforest – Kuta, Bali, Indonesia
September 24-25, 2024

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FOREWORD

Universitas Kristen Maranatha is a research-based teaching university with a sustainable tridarma innovation ecosystem. As one of the best universities in Indonesia, Universitas Kristen Maranatha is determined to create superior human resources and strong character with the values of integrity, caring, and primacy.

Universitas Kristen Maranatha has 6 faculties with a very diverse selection of study programs according to the interests of prospective students, Including:

1. Faculty of Medicine, with Bachelor of Medicine, Medical Profession, and Master of Skin and Aesthetics
2. Faculty of dentistry, with Bachelor of Dentistry, and Dentist Profession
3. Faculty of Psychology, with Bachelor of Psychology, Professional Psychology, and Master of Science in Psychology
4. Faculty of intelligent technology and engineering, with Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Industrial Engineering, Bachelor of Computer System, Bachelor of Informatics Engineering, Bachelor of Information System, Master in Civil Engineering, and Master in Computer Science
5. Faculty of Humanities and Creative Industries, with Diploma in Chinese, Diploma of Fine Arts and Design, Bachelor of English Literature, Bachelor of Japanese Literature, Bachelor of Chinese Literature, Bachelor of Fine Arts, Bachelor of Interior Design, Bachelor of Visual Communication Design, and Bachelor of Architecture
6. Faculty of Law and Digital Business, with Bachelor of Laws, Bachelor of Accounting, Bachelor of Management, Master of Accounting, Master of Management, and Doctor of Management Science

Objectives
1. To create people with excellent character and academic and/or professional skills and competitiveness who can apply, develop, and/or create science, technology and art.
2. Developing and disseminating science, technology, and/or art, and seeking its use to improve the standard of living of the community.
3. Enriching life with the value of Christian life.

Vision
Universitas Kristen Maranatha becomes an independent and creative university, and is able to fill and develop 21st century science, technology and art based on the love and example of Jesus Christ.

Mission
Developing reliable scholars, a conducive atmosphere, and Christian values as an effort to develop science, technology, and art in the implementation of the tridarma of higher education.

https://www.maranatha.edu

Research Synergy Foundation is a digital social enterprise platform that focuses on developing the Global Research Ecosystem towards outstanding global scholars. We build collaborative networks among researchers, lecturers, scholars, and practitioners globally for the realization of knowledge acceleration and to contribute more to society and humanity.
As a social enterprise, our aim is to provide a good research ecosystem and platform for researchers to share, discuss, and disseminate their ideas. In addition, it helps you to improve your research and contribute to the knowledge. Therefore, creating social value and impact is our priority.
From 2017 to 2021, more than 20.000 scholars have participated in our programs from Asia, Australia, Africa, America, and Europe continents. With the average of the increasing number of members by more than 5.000 each year, we continuously strengthen the global research ecosystem by having four support systems that are ready to help members from across the world.
There are various agendas (work and program) that we have already done since 2017 up to present. The agendas are coming from all the support systems in the Global Research Ecosystem, named: Scholarvein, ReviewerTrack, Research Synergy Institute, and Research Synergy Press. Research and publication cannot be seen as a separate part. Otherwise, we should take both as a comprehensive program. Moreover, the quality of the paper is the biggest concern for publication. To achieve the Organization/University/ Institution goal, we provide some agendas that can support you in research and publication enhancement. Some of the prominent agendas are:

1. International Conferences: It aims to create a "tipping point" of opportunities for participants to disseminate their research globally and have reputable scientific publication output.
2. Scientific and Academic Writing Coaching Clinics: It aims to provide a targeted and intensive learning strategy for publishing papers in high-impact Scopus/ WOS international journals.
3. Workshops: It aims to provide a vibrant learning forum to enhance the author's capability of scientific writing skills and the manuscript's quality.
4. Learning and Knowledge Sharing Programs: It aims to provide the best practice and guide from the experts, editors, and publishers' perspectives in research and publication enhancement.
5. Social Programs: It aims to empower and encourage society to share the value of creating an impactful program with us.
6. Research Synergy Foundation welcome all individuals, organizations/institutions (universities, governments, and private sectors) to be part of our Global Research Ecosystem.

https://www.researchsynergy.org/

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Andrijanto, Dr. Eng
Universitas Kristen Maranatha, Indonesia

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Dr. Hendrati Dwi Mulyaningsih
Founder and Chairperson of Research Synergy Foundation

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Assoc. Prof. Dr. Reshma V.K. - Sri Krishna College of Engineering and Technology, India

CONFERENCE CHAIR MESSAGE

Distinguished Participants and Guests,
Excellencies, Ladies, and Gentlemen,

As we gather today for the 2nd International Conference on Industrial and Systems Engineering, Technology, Innovation, and Management (2nd ICISETIM), I am deeply honored to stand before such a distinguished audience. This conference, hosted by the Bachelor Program in Industrial Engineering at Universitas Kristen Maranatha in partnership with the Research Synergy Foundation, serves as a critical platform for sharing knowledge, fostering innovation, and driving collaboration across our fields of expertise.

We are truly grateful to our keynote speakers, whose presence adds immense value to our conference:
- Prof. Ts. Ir. Dr. Chan Yee Kit, Faculty of Engineering and Technology, Multimedia University, Malaysia
- Prof. Yun-Chia Liang, Ph.D., Industrial Engineering and Management Department, Yuan Ze University, Taiwan

Your insights and contributions will undoubtedly inspire us and provide a broader perspective on the diverse topics we are addressing today.

I would also like to acknowledge the 24 outstanding presenters who have submitted their work in the areas of Industrial and Systems Engineering, Technology, Innovation, and Management. The breadth and depth of research being showcased is a testament to the commitment and ingenuity of each of you.

As we move forward, let us use this opportunity not only to learn from one another but also to build lasting connections that will advance our respective fields. Conferences like 2nd ICISETIM are essential in bridging the gap between academia and industry, fostering an environment where innovative solutions can emerge to meet the challenges of tomorrow.

Thank you all for your participation, and I look forward to the fruitful discussions and collaborations that will take place over the course of this event.

Let us embark on this journey together with enthusiasm and a shared vision for a future driven by knowledge, technology, and innovation.

Best regards,

Dr.Eng. Andrijanto, S.T., M.Eng.,
Conference Chair of 2nd ICISETIM

CONFERENCE CHAIR

Dr. Eng. Andrijanto, S.T., M.Eng.,

Conference Chair of 2nd ICISETIM
Universitas Kristen Maranatha, Indonesia

Dr.Eng. Andrijanto, S.T., M.Eng., is a lecturer in the Bachelor Program in Industrial Engineering, Universitas Kristen Maranatha, Indonesia. His interests include safety, human factors, and ergonomics. He obtained a doctoral degree in engineering from the University of Tsukuba, Japan, and a master's in engineering from the Nagaoka University of Technology, Japan.

He received a bachelor's degree in industrial engineering from Universitas Trisakti, Indonesia. His paper in 2022 is recognized by Elsevier as linked to UN SDGs no. 3, 11, and 17. He also participated in the project of the Development of external HMI in spaces where people and moving objects coexist with the University of Tsukuba in 2021. He is also a part of the Transport Ergonomic group, which deals with Indonesian traffic issues

CO-CONFERENCE CHAIR

Dr. Hendrati Dwi Mulyaningsi, S.E., M.M.

Founder & Chairperson of Research Synergy Foundation

Dr. Hendrati Dwi Mulyaningsih is the chairperson and founder of Research Synergy Foundation that has shown great commitment on creating Global Network and Research Ecosystem. This GNR ecosystem has been developing since 2017 up to the present and having increasing numbers of the member up to more than 30.000 from all around the globe. Her passion in how to create impact and co creation value among all the stake holder of RSF has made her focus on upholding integrity in the scientific process through enhancement of RSF's support-support system as like Reviewer track, Scholarvein, Research Synergy Institute and Research Synergy Press. Thus, her work in this area has made her as the Nominee of Impactful Leadership Awards from Tallberg Foundation Sweden 2019 and 2024.

As lecturer, she has been working in the University since 2008 – at present in Indonesia as assistant professor and she hold her Doctoral Science of Management graduated from School of Business and Management Institute of Technology Bandung (SBM-ITB) and she has strong interest to her research project as well as her research field in Social Entrepreneurship, Social Innovation and Knowledge Management.

As researcher, her work studies and research on this research field made her be invited as reviewer in many reputable Scopus and WOS indexed journals and as keynote speaker in many International Conferences in Philippines, Thailand, Malaysia, Indonesia, Australia, Japan, and US. She also has shown her great passion on writing her research study into some books chapter, papers and contemporary scientific articles that has already been published in Springer, Emerald, Taylor and Francis and in many reputable international publishers. The terrific association between her professional experiences as researcher, lecturer, the certified Trainer & Coach combined with her wider horizon on networking in the research area made her establish the strong commitment on having global learning platform to accelerate knowledge through many workshops and research coaching in Research Synergy Institute as one of RSF's support system.

OPENING SPEAKER

Prof. Ir. Sri Widiyantoro, M.Sc., Ph.D., IPU.

Rector of Universitas Kristen Maranatha, Indonesia

Prof. Ir. Sri Widiyantoro, M.Sc., Ph.D. is a professor of Geophysics, and currently he serves as Rector of Universitas Kristen Maranatha, Indonesia. He received his B.Sc. degree in Geophysics from Institut Teknologi Bandung, Indonesia, M.Sc. degree in Geophysics from Kyoto University, Japan, and Ph.D. degree in Geophysics from Australian National University, Australia. Moreover, he also studied Postdoc in Seismology at Tokyo University, Japan. His research interests are in the field of Geophysics and Seismology. He has many articles published in reputable journals, such as SCIENCE and NATURE, which have been cited as many as 4,567 with an H-index of 24 on Scopus.

Oscar Karnalim, S. T., M. T., Ph. D.

Dean of Faculty of Smart Technology and Engineering, Universitas Kristen Maranatha, Indonesia

Oscar Karnalim completed his Ph.D. in Information Technology at the University of Newcastle, Australia. He is now the dean of Faculty of Smart Technology and Engineering, Maranatha Christian University, Indonesia. He was the head of Master Program in Computer Science, the CTO of two startups, the general chair of IEEE ICE-SMARTec, and a seasonal expert. He currently serves as an editor for Springer's Discover Education and Journal of Information Systems Engineering and Business Intelligence. He is also a program committee, a reviewer, and an organizing committee for many journals and conferences including Wiley's CAE, IEEE ToE, IEEE FIE, and ACM ITiCSE. His research interests include educational technologies, academic integrity, artificial intelligence, and software engineering. He has published over 100 research

CLOSING SPEAKER

Victor Suhandi, S.T., M.T., Ph.D.

Head of Bachelor Program in Industrial Engineering,
Universitas Kristen Maranatha, Indonesia

Victor Suhandi is an assistant professor in Industrial Engineering. He received his bachelor degree in Industrial Engineering at Universitas Kristen Maranatha, Indonesia, his master degree in Industrial Engineering and Management at Institut Teknologi Bandung, Indonesia, and his Ph.D. degree in Industrial and Systems Engineering at Chung Yuan Christian University, Taiwan. His research interests are in the fields of Inventory System Problem, Scheduling Problem, Operational Research, and Simulation Modeling.

KEYNOTE SPEAKERS

Prof. Ts. Ir. Dr. Chan Yee Kit

Faculty of Engineering and Technology at Multimedia University, Malaysia

Prof. Ir. Dr. Chan Yee Kit received his B.Eng (Hons) in Electrical Engineering from the University of Malaya and obtained his MEngSc and PhD in Microwave Engineering from the Multimedia University, Malaysia. He is currently the Deputy Dean (Research & Industry Collaborations) and Professor at the Faculty of Engineering and Technology, Multimedia University.

His key interests are synthetic aperture radar design and development, microwave remote sensing, RF system design and drone based advanced imaging. He was the principal investigator for the first UAV based synthetic aperture radar developed in Malaysia and has published more than 100 international journal and conference papers in his field. He is a registered Professional Engineer with Board of Engineer Malaysia as well as Professional Technologist for Malaysia Board of Technologist. In 2021, he has awarded the Top Research Scientists Malaysia by Academy of Sciences Malaysia and he was admitted as Fellow of ASEAN Academy of Engineering & Technology in year 2022.

Prof. Yun-Chia Liang, Ph.D.

Industrial Engineering and Management Dept.,
Yuan Ze University, Taiwan

Prof. Yun-Chia Liang, Ph.D. serves as the Chief of the Global Affairs Office at Yuan Ze University, where he has been a distinguished professor in the Industrial Engineering and Management Department since 2013. Additionally, he is the Deputy Director of the Smart Production and Innovation Management (SPIM) Research Center, reflecting his leadership in advancing industrial engineering research and education. With a robust administrative background, Dr. Liang has held various key positions at Yuan Ze University, including Department Chair of Industrial Engineering and Management from 2016 to 2022, and Director of the Office of International Affairs in 2016.

He also directed the Admission Section within the Office of Academic Affairs from 2013 to 2016. Dr. Liang's contributions to the academic community are further evidenced by his editorial roles. Since January 2024, he has been a member of the Editorial Board for the Journal of Algorithms and a guest editor for its special issue on "Metaheuristic Algorithms in Optimization and Applications." His expertise is frequently sought after, highlighted by his keynote and distinguished speaker invitations at prominent conferences such as the APC IEOM2021 and ISIEM2021. His professional affiliations include memberships in the Institute of Electrical and Electronics Engineers (IEEE), the Chinese Institute of Industrial Engineers (CIIE), the Operations Research Society of Taiwan (ORSTW), and the International Association of Engineers (IAENG). Dr. Liang earned his Ph.D. in Industrial and Systems Engineering from Auburn University in 2001, marking the beginning of a prolific career dedicated to industrial engineering and management.

KEYNOTE SPEAKERS

Dr. Eng. Andrijanto, S.T., M.Eng.

Universitas Kristen Maranatha, Indonesia

Dr.Eng. Andrijanto, S.T., M.Eng., is a lecturer in the Bachelor Program in Industrial Engineering, Universitas Kristen Maranatha, Indonesia. His interests include safety, human factors, and ergonomics. He obtained a doctoral degree in engineering from the University of Tsukuba, Japan, and a master's in engineering from the Nagaoka University of Technology, Japan.

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MODERATOR

Santi Rahmawati, S.T., M.S.M.

Founder & Director of Global Network and Operation
Reserch Synergy Foundation

Santi is a Founder and Global Network Operation Director of the Research Synergy Foundation (RSF). She actively engaged with scholars around the world for strengthening the Global Research Ecosystem. As the Director of Scholarvein, she creates, maintains, and develops the integrated system for managing international scientific conference and forum since 2017 up to present and already give benefit to more than 8.448 participants coming from >85 countries. With the combination of engineering and management science educational background, she has built the optimum workflow for scholars to contribute more to the society and humanities.

Santi holds her bachelor's degree of industrial engineering from Universitas Indonesia (UI). Furthermore, she had received her Master of Science Management (focusing on Entrepreneurship and Technology Management) from Institut Teknologi Bandung (ITB) in 2015. Santi worked for several years as a Research Assistant and later as the Associate Director of the Centre for Innovation Entrepreneurship and Leadership at the Institut Teknologi Bandung. In her roles Santi helped lead the centre's Micro-Enterprise Development project, designed to support economic development throughout West Java Indonesia through the provision of entrepreneurship capability development. She also collaborates with ITB and Victoria University of Wellington, New Zealand, on a project that focuses on how Information Technology start-ups acquire finance support in developing economies.

Santi has appointed as a Gateway Advisor in F1000Research (Scopus Q1) and Taylor & Francis Open Access Advisor (Scopus Q1, Q2 & WOS). She has already been an editor of three published books (both published by Routledge, Taylor & Francis), a reviewer in many reputable international journals, an author and co-authored multiple international research articles and book chapters. Santi also serves as the Managing Editor for six international journals https://journals.researchsynergypress.com : IJEBCE, IJEIIS, IJEASS, JSETP, IJMADIC, and JHASIB.

SESSION CHAIRS

Dr. Amarjit Kene

SVRI's College of Engineering, Pandharpur

Dr. Amarjit Prakashrao Kene, with a Ph.D. in Mechanical Engineering from IIT Kanpur, is a distinguished academic and researcher with extensive expertise spanning both theoretical and practical aspects of engineering. He is the Dean of Research & Development and an Associate Professor in the Mechanical Engineering Department at SVERI's College of Engineering, Pandharpur. In his leadership role, Dr. Kene is instrumental in driving research initiatives, fostering innovation, and mentoring future engineers to become industry-ready professionals.

During his career, Dr. Kene has worked on diverse projects that blend cutting-edge technology with practical applications. His early work during his master's focused on optimizing the build orientation of 3D-printed products, where he developed 21 unique codes to simplify the process of slicing and tool path generation—advancing the efficiency and precision of additive manufacturing.

In his Ph.D., Dr. Kene made significant contributions to sensor fusion in conventional machining processes, improving reliability and predictive accuracy. He developed an analytical model integrating sensor data from various inputs to predict tool wear and other machining parameters. His approach proved more accurate than traditional methods like regression and neural networks, setting new standards for precision in machining.

Beyond his technical work, Dr. Kene actively collaborates with industry partners, contributes to academic conferences, and has published in leading journals. His commitment to bridging the gap between academia and industry continues to inspire innovation, while his leadership within the institution promotes a culture of research excellence and continuous learning.

Lou Simon Catimbang

De La Salle University; Polytechnic University of the Philippines

Lou Simon M. Catimbang is a faculty of the Industrial Engineering Department of the Polytechnic University of the Philippines - Sta. Rosa Campus. He finished his Bachelor of Science in Industrial Engineering at the Polytechnic University of the Philippines - Santo Tomas, Batangas Campus, Master of Science in Industrial Engineering and Management at the Polytechnic University of the Philippines, Manila, and pursuing his Ph.D. in Industrial Engineering at De La Salle University, Manila, Philippines. His industrial training and experience revolve around process improvement and methods study. His research interests include optimization, circular economy, and food security.

SESSION CHAIRS

Prashant Maruti Pawar

SVERI's College of Engineering, Pandharpur

Dr. Prashant Pawar is a distinguished professor at SVERI's College of Engineering, Pandharpur, and the Incharge Dean of Science and Technology, PAH, Solapur University. A notable figure in the academic fraternity, he is renowned for his innovative approach to utilizing cutting-edge technologies for societal development and demonstrating their real-world applications in the field. His academic credentials include a Ph.D. from the Indian Institute of Science (IISc), Bangalore, where his pioneering research focused on Structural Health Monitoring of Composite Helicopter Rotor Blades, and an M.Tech. in Structural Engineering from IIT Guwahati.

With over two decades of experience, Dr. Pawar has guided numerous Ph.D. and postgraduate students, fostering research excellence. He has also held a prestigious role as a Research Professor at Konkuk University in South Korea, contributing to advanced helicopter research, and worked as a diagnostics engineer at Eaton Industries Pvt. Ltd., Pune. His research contributions span over 100 publications, 8 authored books (6 published by Springer), and 2 granted patents.

A leader in securing research funding, Dr. Pawar has led major projects supported by the Government of India and Maharashtra, including a ₹33.73 Cr collaboration with IIT Bombay aimed at developing a Drone Ecosystem for Societal Development. His hands-on approach to applying technology for real-world solutions is further exemplified by his leadership in consultancy projects worth over ₹2 Cr, focusing on structural audits and diagnostics.

Dr. Pawar's involvement in institutional development is equally significant. He is a key member of various university committees, playing a critical role in accreditation, research development, and intellectual property initiatives. His numerous awards, including the AICTE-Visvesvaraya Best Teacher Award, underscore his dedication to education and his innovative contributions to teaching, research, and societal advancement.

Dr. Christina Wirawan

Universitas Kristen Maranatha

Christina Wirawan is a lecturer at Industrial Engineering, Maranatha Christian University. He earned his doctorate from the School of Business Management, Bandung Institute of Technology. Her research interests include industrial estate firms, product design, service science, quality engineering, and entrepreneurship. She likes to combine engineering study with social and management science in her research.

SESSION CHAIRS

Assoc. Prof. Dr. Reshma V.K.

Sri Krishna College of Engineering and Technology, India

Assoc. Prof. Dr. Reshma V.K. is recipient, in Information and Computer Engineering, from Noorul Islam Centre for Higher Education in 2021, Master of Engineering in Software Engineering in 2012 from Sri Ramakrishna Engineering College, Coimbatore, Bachelor of Technology in Information Technology in 2010 from P.S.R Engineering College, Sivakasi, both affiliated to Anna University Chennai.

Her area of interest is Image Processing, Steganography, Neural Networks, and Machine Learning. She has contributed 20+technical papers in SCI/SCOPUS and other international journals and 20+ papers in various international conferences. She published more than 20 patents in her field of Expertise and also focused on Multidisciplinary areas. And her patents got granted from Government of India, Australian Government. Currently Acting as Reviewer, Editor in Various Journals and Conferences. She is presently working as an Associate Professor in the Department of Computer Science and Engineering in Sri Krishna College of Engineering and Technology, Coimbatore, Tamilnadu, India.

Assoc. Prof. Dr. Balaji Sundaramurthy

Al Zahra College for Women, Oman

Dr S. Balaji is working as an Associate Professor in Al Zahra college for Women, Muscat Sultanate of Oman. He had completed his PhD in Software Engineering at St Peters University Chennai, India. Pursuing his Post Doctoral Fellowship at Srinivas University, Mangalore, India. He had completed MCA and MPhil. He has over 18years of experience in the teaching profession. He specialized in the field of Software Engineering and Project documentation. His research interest in the areas of Software Engineering, Software Testing and AI.

CONFERENCE PROGRAM – Day 1

Tuesday | September 23, 2024

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CONFERENCE PROGRAM
The 2nd International Conference on Industrial and Systems Engineering, Technology, Innovation, and Management (2nd ICISETIM)
Venue Conference: Swiss-Belhotel Rainforest, Kuta, Bali, Indonesia

Tuesday, 24 September 2024

Join Zoom Meeting:
https://bit.ly/2ndICISETIM

Meeting ID: *878 4731 6846*
Passcode: */cisetim*

DAY 1 - Tuesday, 24 September 2024

Time (UTC+8)	Dur'	Activity
		Main Room
8:45 - 9:00	0:15	**Welcome reception and registration at Swiss-Belhotel Rainforest, Kuta, Bali, Indonesia** **&** **Online Participant Login and Join Virtual Conference by ZOOM - start at 9 AM**
9:00 - 9:15	0:15	**Welcome Address** and Conference Publication Announcement by MC
9:15 - 9:20	0:05	**Doa Recitation & National Anthem of Indonesia**
9:20 - 9:25	0:05	**Welcome Remarks of 2nd ICISETIM** **Dr.Eng. Andrijanto, S.T., M.Eng.** Conference Chair of 2nd ICISETIM Universitas Kristen Maranatha, Indonesia
9:25 - 9:35	0:10	**Opening Speech** **Prof. Ir. Sri Widiyantoro, M.Sc., Ph.D., IPU** Rector of Universitas Kristen Maranatha, Indonesia
9:35 - 9:45	0:10	**Speech** **Oscar Karnalim, S. T., M. T., Ph. D.** Dean of Faculty of Smart Technology and Engineering, Universitas Kristen Maranatha, Indonesia
9:45 - 9:55	0:10	**Global Research Ecosystem Introduction** **Dr. Hendrati Dwi Mulyaningsih** Co-Conference Chair of 2nd ICISETIM Founder & Chairperson of Research Synergy Foundation
9:55 - 10:00	0:05	**Conference Group Photo (Onsite and Virtual) & Preparation for Keynote Speakers Session**
10:00 - 10:20	0:20	**Keynote Speaker 1** **Prof. Yun-Chia Liang, Ph.D.** Industrial Engineering and Management Dept., Yuan Ze University, Taiwan
10:20 - 10:25	0:05	Token of Appreciation for Keynote Speaker
10:25 - 10:45	0:20	**Keynote Speaker 2** **Prof. Ts. Ir. Dr. Chan Yee Kit** Faculty of Engineering and Technology at Multimedia University, Malaysia
10:45 - 10:50	0:05	Token of Appreciation for Keynote Speaker
10:50 - 11:05	0:15	**Coffee & Tea Break**
		Academic Onsite Parallel Presentation Session, **Live from Swiss-Belhotel Rainforest, Kuta, Bali, Indonesia** **Session 1** **(Zoom Main Room)**
11:05 - 11:15	0:10	**Session Chairs Introduction of Onsite Presentation:** **Dr. Amarjit Kene - SVERI's College of Engineering, Pandharpur** **Prashant Maruti Pawar - SVERI's College of Engineering, Pandharpur**
11:15 - 11:30	0:15	**Paper ID: ICT24102** **Presenter: Lou Simon Catimbang - De La Salle University; Polytechnic University of the Philippines** Title: "Closing the Loop: A Bibliometric Analysis of Research on Product Design for a Circular Economy"
11:30 - 11:45	0:15	**Paper ID: ICT24114** **Presenter: Christina Wirawan - Universitas Kristen Maranatha** Title: "Preserving the Angkringan Culture in Indonesia"
11:45 - 11:50	0:05	**Distributing Certificate of Presentation, Testimonial, and Post-conference information announcement**
11:50 - 13:00	1:10	**Onsite Participant Lunch Break**
13:00 - 13:20	0:20	**Keynote Speaker 3** **Dr.Eng. Andrijanto, S.T., M.Eng.** Bachelor Program in Industrial Engineering, Universitas Kristen Maranatha, Indonesia
13:20 - 13:25	0:05	Token of Appreciation for Keynote Speaker

Academic Onsite Parallel Presentation Session, Live from Swiss-Belhotel Rainforest, Kuta, Bali, Indonesia Session 2 (Zoom Main Room)				
13:25	-	13:35	0:10	**Session Chairs Introduction of Onsite Presentation:** **Lou Simon Catimbang - De La Salle University; Polytechnic University of the Philippines** **Dr. Christina Wirawan - Universitas Kristen Maranatha**
13:35	-	13:50	0:15	**Paper ID: ICT24112** **Presenter: Prashant Maruti Pawar - SVERI's College of Engineering, Pandharpur** Title: "RGB Image Classification Using Deep Learning for Predicting Sugarcane Crop Age"
13:50	-	14:05	0:15	**Paper ID: ICT24174** **Presenter: Amarjit Prakashrao Kene - SVERI's College of Engineering, Pandharpur** Title: "Tool Wear Monitoring in Hard Turning Using Sensor Fusion : An analytical approach"
14:05	-	14:20	0:15	**Paper ID: ICT24111** **Presenter: Meenakshi Mukund Pawar - SVERI's College of Engineering, Pandharpur** Title: "Advancing Sugarcane Farm Management through NDVI-Based Color Mapping and Drone Imaging"
14:20		14:35	0:15	**Paper ID: 621513** **Presenter: Vrunal More - SVERI's College of Engineering, Pandharpur** Title: "Immobilization of Saccharomyces Cerevisiae as an Advanced Approach Using Gellan Gum Phytagel Beads in Pomegranate Wine Production"
ONSITE POSTER PRESENTATION				
14:35	-	14:50	0:15	**POSTER PRESENTATION** **Paper ID: ICT24117** **Presenter: Yulianti Talar - Universitas Kristen Maranatha** Title: "Proposals for Enhancing the Competitiveness of the Online Stores in Indonesia"
14:50	-	15:05	0:15	**POSTER PRESENTATION** **Paper ID: ICT24106** **Presenter: Andrijanto - Universitas Kristen Maranatha** Title: "Application of Unobstructed Vehicle in Naturalistic Driving Study for Observing Indonesian Motorcyclist's Braking and Signaling Habits in Daily Driving. Case Study: Bandung Urban Areas"
15:05	-	15:10	0:05	**Distributing Certificate of Presentation, Testimonial, and Post-conference information announcement**
15:10	-	15:25	0:15	**Coffee & Tea Break (Preparation for Closing Ceremony)**
Main Room				
15:25	-	15:40	0:15	**Awarding Ceremony** **Best Presentations** **Best Papers** **Session Chairs**
15:40	-	15:45	0:05	**Closing of 2nd ICISETIM - DAY 1** **Victor Suhandi, S.T., M.T., Ph.D.** Head of Bachelor Program in Industrial Engineering, Universitas Kristen Maranatha, Indonesia

LIST OF PRESENTERS

Tuesday | September 24, 2024

Room: Main Room 1 – Session 1
Time: 11:05 – 11:50 (UTC+8)
Session Chairs:
Dr. Amarjit Kene - SVERI's College of Engineering, Pandharpur
Prashant Maruti Pawar - SVERI's College of Engineering, Pandharpur

Paper ID: ICT24102 **Presenter: Lou Simon Catimbang - De La Salle University; Polytechnic University of the Philippines** Title: "Closing the Loop: A Bibliometric Analysis of Research on Product Design for a Circular Economy"
Paper ID: ICT24114 **Presenter: Christina Wirawan - Universitas Kristen Maranatha** Title: "Preserving the Angkringan Culture in Indonesia"

Room: Main Room – Session 2
Time: 13:25 – 15:10 (UTC+8)
Session Chairs:
Lou Simon Catimbang - De La Salle University; Polytechnic University of the Philippines
Dr. Christina Wirawan - Universitas Kristen Maranatha

Paper ID: ICT24112 **Presenter: Prashant Maruti Pawar - SVERI's College of Engineering, Pandharpur** Title: "RGB Image Classification Using Deep Learning for Predicting Sugarcane Crop Age"
Paper ID: ICT24174 **Presenter: Amarjit Prakashrao Kene - SVERI's College of Engineering, Pandharpur** Title: "Tool Wear Monitoring in Hard Turning Using Sensor Fusion : An analytical approach"
Paper ID: ICT24111 **Presenter: Meenakshi Mukund Pawar - SVERI's College of Engineering, Pandharpur** Title: "Advancing Sugarcane Farm Management through NDVI-Based Color Mapping and Drone Imaging"
Paper ID: 621513 **Presenter: Vrunal More - SVERI's College of Engineering, Pandharpur** Title: "Immobilization of Saccharomyces Cerevisiae as an Advanced Approach Using Gellan Gum Phytagel Beads in Pomegranate Wine Production"
ONSITE POSTER PRESENTATION
POSTER PRESENTATION **Paper ID: ICT24117** **Presenter: Yulianti Talar - Universitas Kristen Maranatha** Title: "Proposals for Enhancing the Competitiveness of the Online Stores in Indonesia"
POSTER PRESENTATION **Paper ID: ICT24106** **Presenter: Andrijanto - Universitas Kristen Maranatha** Title: "Application of Unobstructed Vehicle in Naturalistic Driving Study for Observing Indonesian Motorcyclist’s Braking and Signaling Habits in Daily Driving. Case Study: Bandung Urban Areas"

CONFERENCE PROGRAM – Day 2

Wednesday | September 25, 2024

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Wednesday, 25 September 2024

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DAY 2 - Wednesday, 25 September 2024

Time (UTC+8)	Dur'	Activity
		Main Room
8:45 - 8:55	0:10	**Participant Login and Join Virtual Conference**
8:55 - 9:10	0:15	**Welcoming and Conference Agenda announcement by MC**
9:10 - 9:15	0:05	**Welcome Remarks of 2nd ICISETIM** **Dr.Eng. Andrijanto, S.T., M.Eng.** Conference Chair of 2nd ICISETIM Universitas Kristen Maranatha, Indonesia

Academic Online Parallel Presentation Session, (Zoom Main Room)			Academic Online Parallel Presentation Session, (Zoom Breakout Room)		
9:15 - 9:25	0:10	**Session Chairs Introduction of Online Presentation:** **Assoc. Prof. Dr. Balaji Sundaramurthy - Al Zahra College for Women, Oman**	9:15 - 9:25	0:10	**Session Chairs Introduction of Online Presentation:** **Assoc. Prof. Dr. Reshma V.K. - Sri Krishna College of Engineering and Technology, India**
9:25 - 9:40	0:15	**Paper ID: ICT24105** **Presenter: Raden Muhammad Dafla - Institut Teknologi Bandung** Title: "Consumer Privacy Concerns and Acceptance of AI-Driven Marketing in Indonesian E-commerce"	9:25 - 9:40	0:15	**Paper ID: ICT24101** **Presenter: Parupalli Sai Likhitha - Guru Nanak Institute of Technology** Title: "Breast Cancer Diagnosis With Elastography Images Using Image Processing and Machine Learning"
9:40 - 9:55	0:15	**Paper ID: ICT24108** **Presenter: Al Taqdir Badari - BINUS Business School, Doctor of Research in Management, Bina Nusantara University, Jakarta, Indonesia** Title: "Tourism Innovation Through Co-creation: How Trust, Experience, and Innovativeness Drive Tourist Participation"	9:40 - 9:55	0:15	**Paper ID: ICT24103** **Presenter: Erma Suryani - Institut Teknologi Sepuluh Nopember** Title: "A Dynamic Simulation Model for Enhancing Rooftop Solar Power Plant Utilization"
9:55 - 10:10	0:15	**Paper ID: ICT24107** **Presenter: Erma Suryani - Institut Teknologi Sepuluh Nopember** Title: "Dynamic Simulation Model for Investigating the Potential Development of Wind Power Plants to Increase Fulfillment Ratio"	9:55 - 10:10	0:15	**Paper ID: 287053** **Presenter: Nismah Panjaitan - Universitas Sumatera Utara** Title: "Optimization of Work Posture PT. Xyz: Analysis of Rapid Entire Body Assessment (REBA) Method to Improve Health and Productivity"
10:10 - 10:25	0:15	**Paper ID: ICT24113** **Presenter: Hasnaa ALOZADE - ENSEM, Hassan II University** Title: "ISO 9001:2015 and Lean Six Sigma: A Systematic Literature Review"	10:10 - 10:25	0:15	**Paper ID: 814799** **Presenter: Nismah Panjaitan - Universitas Sumatera Utara** Title: "Workload Analysis Using Heart Rate Parameters: A Quantitative Approach in Measuring Energy and Cardiovascular Response in Operators at PT.x"
10:25 - 10:40	0:15	**Paper ID: ICT24115** **Presenter: Fikri Abdulhakim Ichsan - Institut Teknologi Bandung** Title: "Investigation and Optimization of Raster Angle to Reduce Energy Consumption and Carbon Footprint in 3D Printing"	10:25 - 10:40	0:15	**Paper ID: ICT24118** **Presenter: Hennie Husniah - Langlangbuana University** Title: "Aplications of Lambert-W Function in Industrial Technology and Operation Research Problems"
10:40 - 10:55	0:15	**Paper ID: ICT24109** **Presenter: Yohanes Pringeten Dilanto Sembiring Depari - Institut Teknologi Sepuluh Nopember** Title: "Crashworthiness Analysis on Energy Absorber Module of Indonesian High-Speed Train Using Bio-Inspired Structure"	10:40 - 10:55	0:15	**Paper ID: 786517** **Presenter: Bernuwi Priyatna Iskandar - Institut Teknologi Bandung** Title: "A Business Model of Product-Service Systems for Battery Electric Vehicles"
10:55 - 11:10	0:15	**Paper ID: ICT24110** **Presenter: Hammam Yusdin - Institut Teknologi Sepuluh Nopember** Title: "Designing an Ergonomic Egrek (Palm Oil Sickle) for Palm Oil Harvesting: A Quality Function Deployment and Iterative Design Approach"	10:55 - 11:10	0:15	**Paper ID: ICT24173** **Presenter: Hennie Husniah - Langlangbuana University** Title: "Optimal Strategy of Battery Electric Bus Maintenance Contract"
11:10 - 11:25	0:15	**Paper ID: 311309** **Presenter: Muh Luqman Khakim - Institut Teknologi Sepuluh Nopember** Title: "Crashworthiness Analysis of Trailer Structure of Indonesian High Speed Train"	11:10 - 11:15	0:05	**Distributing Certificate of Presentation, Testimonial, and Post-conference information announcement**
11:25 - 11:30	0:05	**Distributing Certificate of Presentation, Testimonial, and Post-conference information announcement**			
11:30 - 12:00	0:30	**Short break and back to Main Room for Awarding session and Closing Ceremony**			
12:00 - 12:15	0:15	**Awarding Ceremony** **Best Presentations** **Best Papers** **Session Chairs**			
12:15 - 12:20	0:05	**Closing of 2nd ICISETIM - DAY 2** **Victor Suhandi, S.T., M.T., Ph.D.** Head of Bachelor Program in Industrial Engineering, Universitas Kristen Maranatha, Indonesia			

LIST OF PRESENTERS

Wednesday | September 25, 2024

Room: Main Room – Session
Time: 09:15 – 11:30 (UTC+8)
Session Chairs: Assoc. Prof. Dr. Balaji Sundaramurthy - Al Zahra College for Women, Oman

Paper ID: ICT24105 **Presenter: Raden Muhammad Daffa - Insitut Teknologi Bandung** Title: "Consumer Privacy Concerns and Acceptance of Ai-Driven Marketing in Indonesian E-commerce"
Paper ID: ICT24108 **Presenter: Al Taqdir Badari - BINUS Business School, Doctor of Research in Management, Bina Nusantara University, Jakarta, Indonesia** Title: "Tourism Innovation Through Co-creation: How Trust, Experience, and Innovativeness Drive Tourist Participation"
Paper ID: ICT24107 **Presenter: Erma Suryani - Institut Teknologi Sepuluh Nopember** Title: "Dynamic Simulation Model for Investigating the Potential Development of Wind Power Plants to Increase Fulfillment Ratio"
Paper ID: ICT24113 **Presenter: Hasnaa ALOZADE - ENSEM, Hassan II University** Title: "ISO 9001:2015 and Lean Six Sigma: A Systematic Literature Review"
Paper ID: ICT24115 **Presenter: Fikri Abdulhakim Ichsan - Insitut Teknologi Bandung** Title: "Investigation and Optimization of Raster Angle to Reduce Energy Consumption and Carbon Footprint in 3D Printing"
Paper ID: ICT24109 **Presenter: Yohanes Pringeten Dilianto Sembiring Depari - Institut Teknologi Sepuluh Nopember** Title: "Crashworthiness Analysis on Energy Absorber Module of Indonesian High-Speed Train Using Bio-Inspired Structure"
Paper ID: ICT24110 **Presenter: Hammam Yusdin - Institut Teknologi Sepuluh Nopember** Title: "Designing an Ergonomic Egrek (Palm Oil Sickle) for Palm Oil Harvesting: A Quality Function Deployment and Iterative Design Approach"
Paper ID: 311309 **Presenter: Muh Luqman Khakim - Institut Teknologi Sepuluh Nopember** Title: "Crashworthiness Analysis of Trailer Structure of Indonesian High Speed Train"

Room: Breakout Room
Time: 09:15 – 11:30 (UTC+8)
Session Chairs: Assoc. Prof. Dr. Reshma V.K. - Sri Krishna College of Engineering and Technology, India

Paper ID: ICT24101 **Presenter: Parupalli Sai Likhitha - Guru Nanak Institute of Technology** Title: "Breast Cancer Diagnosis With Elastography Images Using Image Procesing and Machine Learning"
Paper ID: ICT24103 **Presenter: Erma Suryani - Institut Teknologi Sepuluh Nopember** Title: "A Dynamic Simulation Model for Enhancing Rooftop Solar Power Plant Utilization"
Paper ID: 287053 **Presenter: Nismah Panjaitan - Universitas Sumatera Utara** Title: "Optimization of Work Posture PT. Xyz: Analysis of Rapid Entire Body Assesment (REBA) Method to Improve Health and Productivity"
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Paper ID: ICT24118 **Presenter: Hennie Husniah - Langlangbuana University** Title: "Aplications of Lambert-W Function in Industrial Technology and Operation Research Problems"
Paper ID: 786517 **Presenter: Bermawi Priyatna Iskandar - Institut Teknologi Bandung** Title: "A Business Model of Product-Service Systems for Battery Electric Vehicles"
Paper ID: ICT24121 **Presenter: Vincent Jonathan - Universitas Kristen Maranatha** **Title: "Room Mapping System for Small-Scale Industrial Autonomous Mobile Robots (AMR)"**
Paper ID: ICT24173 **Presenter: Hennie Husniah - Langlangbuana University** Title: "Optimal Strategy of Battery Electric Bus Maintenance Contract"

LIST OF ONSITE PARTICIPANTS

No	Name	Name of University/ Institution
1	Dr.Eng. Andrijanto, S.T., M.Eng.	Bachelor Program in Industrial Engineering, Universitas Kristen Maranatha, Indonesia
2	Dr. Amarjit Kene	SVERI's College of Engineering, Pandharpur
3	Prashant Maruti Pawar	SVERI's College of Engineering, Pandharpur
4	Lou Simon Catimbang	De La Salle University; Polytechnic University of the Philippines
5	Christina Wirawan	Universitas Kristen Maranatha
6	Vincent Jonathan	Universitas Kristen Maranatha
7	Meenakshi Mukund Pawar	SVERI's College of Engineering, Pandharpur
8	Vrunal More	SVERI's College of Engineering, Pandharpur
9	Yulianti Talar	Universitas Kristen Maranatha
10	Dr. Mukund Maruti Pawar	SVERI's College of Engineering, Pandharpur
11	Dr. Amarjit Prakashrao Kene	SVERI's College of Engineering, Pandharpur
12	Ms. Rajni Amarjit Kene	SVERI's College of Engineering, Pandharpur
13	Ms. Pooja Ronge	SVERI's College of Engineering, Pandharpur
14	Dipti Amol Tamboli	SVERI's College of Engineering, Pandharpur
15	Dr. Ir. Christina Wirawan, M.T.	Universitas Kristen Maranatha
16	Yulianti, S.T., M.T.	Universitas Kristen Maranatha

Track: Information Technology

A Dynamic Simulation Model for Enhancing Rooftop Solar Power Plant Utilization

| Erma Suryani[1], Nur Nindya Risnina[2,] Alifia Az Zahra[3]

[1,2,3]Institut Teknologi Sepuluh Nopember

Abstract

Background – Renewable energy is energy derived from unlimited and inexhaustible natural resources, even when used continuously, with solar energy having great potential in Indonesia. East Java is one of the provinces with the greatest potential for Rooftop Solar Power Plants, but its utilization is still minimal.

Purpose – This study aims to develop a model and scenario to increase the fulfillment of renewable energy through Rooftop Solar Power Plants in East Java using a dynamic system simulation model.

Design/methodology/approach – System modeling is conducted using Causal Loop Diagram and Stock and Flow Diagram, then simulated for several years to come to project the increase in the use of Rooftop Solar Power Plants through the model scenario.

Findings – In this study, a scenario for providing incentive policies was developed. The results of simulating the model scenario show an increase in the fulfillment ratio up to 0.277% by 2035.

Research limitations – This study focuses on rooftop solar PV development in East Java.

Originality/value – This study is expected to provide policy strategy recommendations to the government to increase the utilization of Rooftop Solar Power Plants.

Keywords: Renewable Energy, Solar Power, System Dynamics, Model, Sustainable

Augmented Reality in T-shirt Retail: Understanding User Engagement and Purchase Intention through Instagram Filters

| Christopher Christopher[1], Chin-Hung Teng[2]

[1]Yzu University, [2]Yuan Ze University

Abstract

Background – With the rapid growth of mobile shopping, AR has emerged as a promising technology that enhances the shopping experience by merging the digital and physical worlds.

Purpose – Explores the impact of augmented reality (AR) features on consumer behavior, particularly focusing on Instagram filters in the T-shirt retail industry.

Design/methodology/approach – This study uses Instagram filters from an account named Apprecio to test a hypothesis with 105 online respondents who will use the filters on their mobile devices. Their responses will be analyzed using the partial least squares method.

Findings – Findings indicate that while perceived augmented reality, vividness, and hedonic factors contribute to the overall user experience, they do not significantly influence purchase intention or repeated usage. Instead, interactivity and utilitarian aspects are more effective in driving consumer engagement and sales.

Research limitations – The study is limited by its small sample size, narrow focus on Instagram filters within the T-shirt retail industry, and lack of detailed exploration of specific interactive AR features.

Originality/value – The originality and value of this study focused on an on an examination of the role of augmented reality (AR) features, specifically Instagram filters, within the T-shirt retail industry.

Keywords: Augmented Reality (AR), Instagram Filters, Purchase Intention, Mobile Shopping

Red-Green-Blue (RGB) Image Classification Using Deep Learning for Predicting Sugarcane Crop Age

Swati Prashant Pawar[1], Prashant Maruti Pawar[2], Bhagyashri Deshmukh[3]

[1,2,3]SVERI's College of Engineering, Pandharpur,

Abstract

Background – Monitoring sugarcane growth stages traditionally involves manual processes that are both time-consuming and prone to errors. In light of these challenges, this study explores the application of deep learning techniques to automate and improve the accuracy of crop monitoring, specifically focusing on the classification of sugarcane growth stages.

Purpose – In this research a deep learning-based system that leverages high-resolution drone imagery for precise sugarcane age classification has been developed for accurately identifying the growth stages of Sugarcane

Design/methodology/approach – The study is structured around the systematic capture of high-resolution drone images at various stages of sugarcane growth. These images are carefully stitched together to create a comprehensive dataset, followed by segmentation to isolate key areas of interest for further analysis. The ResNet-50 deep learning architecture, augmented with an additional fully connected layer, is then utilized to recognize and classify intricate patterns associated with different growth stages. The model is rigorously trained on cropped sections of the segmented images to ensure it can effectively identify subtle growth-specific features. To assess the model's effectiveness, its performance is compared against alternative deep learning architectures such as GoogLeNet and VGG. This comparative analysis confirms the superior accuracy and robustness of the ResNet-50 model in detecting sugarcane growth patterns.

Findings – The research findings demonstrate that the enhanced ResNet-50 model significantly outperformed other architectures, achieving an impressive 91% accuracy in classifying sugarcane growth stages. This underscores the model's effectiveness in agricultural image analysis and highlights the potential of deep learning techniques to revolutionize precision agriculture by providing a robust framework for future advancements in crop monitoring.

Research limitations – The dataset used in this study is based on drone images from specific sugarcane fields, which may limit the generalizability of the results across different regions and environmental conditions.

Originality/value – This study is a pioneering effort in using deep learning for sugarcane age classification through high-resolution drone imagery. By achieving a 91% accuracy rate, the research not only demonstrates the significant potential of such techniques in enhancing crop monitoring but also sets a new benchmark in the field of agricultural image analysis.

Keywords: Deep Learning, ResNet-50, Sugarcane Age Classification, Precision Agriculture, Agricultural Image Analysis

Track: Industrial Design

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Closing the Loop: A Bibliometric Analysis of Research on Product Design for a Circular Economy

| Lou Simon Catimbang[1], Charlle Sy[2]

[1,2]De La Salle University; Polytechnic University of the Philippines

Abstract

Background – The Circular Economy emerged as a vital strategy for addressing the traditional linear economy's environmental and resource challenges, which followed a 'take-make-dispose' model. In contrast to the linear approach, it aims to redefine growth by decoupling economic activity from finite resource consumption and eliminating waste.

Purpose – This research aims to analyze the existing literature on product design for the circular economy. By conducting a bibliometric analysis, the study seeks to understand the current state of research, identify influential works and authors, and highlight emerging trends and gaps. This systematic evaluation offers insights into the development and impact of the field, guiding future research and informing the development of sustainable products and business models.

Design/methodology/approach – Data collection focused on publications from 1986 to May 31, 2024, using the Scopus database. A comprehensive search strategy was employed, incorporating keywords such as "Circular Economy," "Eco-design," "Circular Product Design," "Lifecycle Assessment," and related terms. Harzing's Publish or Perish and VOSviewer tools were used for data analysis, examining citation metrics, keyword co-occurrence, and bibliometric networks to visualize research trends and collaboration patterns.

Findings – The analysis revealed that the United States, Germany, and the United Kingdom led in research output on product design for a circular economy. Dominant subject areas included engineering, environmental science, and computer science, reflecting the field's technical and scientific focus. The research landscape showed a significant increase in publications in recent years, indicating growing interest and investment in circular economy principles. Key themes identified included sustainability, resource efficiency, and lifecycle assessment. However, gaps remained in developing comprehensive metrics for assessing circularity and the social aspects of the circular economy.

Research limitations – The study was limited to publications from 1986 to May 31, 2024, and focused on documents indexed in the Scopus database. Future researchers should consider expanding the scope to include other databases and more recent publications to capture the latest developments in the field.

Originality/value – The findings highlighted the field's interdisciplinary nature and identified key areas for future research. The insights gained could inform policymakers, researchers, and practitioners in developing more effective strategies and policies to promote sustainable product design and advance the transition to a circular economy.

Keywords: Circular economy, product design, eco-design, lifecycle assessment, sustainable materials

Crashworthiness Analysis on Energy Absorber Module of Indonesian High-Speed Train Using Bio-Inspired Structure | Yohanes Pringeten Dilianto Sembiring Depari[1], Achmad Syaifudin[2], Beny Halfina[3], Jean Mario Valentino[4], Irfan Ansori[5], Bagus Anang Nugroho[6], Aam Muharam[7]

[1] Institut Teknologi Sepuluh November dan Badan Riset Inovasi Nasional, [2]Institut Sepuluh November (ITS), [3,4,5,6,7]Badan Riset Inovasi Nasional (BRIN)

Abstract

Background – The Energy Absorber Module (EAM) is an important component of the train structure, which is specially designed to reduce the impact force in the case of a longitudinal collision during high-speed trains. Structures inspired by nature were found to have higher than conventional structures. However, bio-inspired structure is rarely implemented in the design of the train head.

Purpose – The research aims to find a combination between the variation of crash box structure with bio-inspired structure using 6061-T6 and 6005-T6 aluminium material that is the most optimal in resisting residual impact energy after being absorbed by crash energy management of high-speed trains.

Design/methodology/approach – Several designs were developed from the existing crash box. Bio-inspired cross-section structures were implemented to improve the performance and strength of the crash box. The designs were analyzed using numerical simulation in LS-DYNA software to simulate collision and calculate energy absorption.

Findings – Based on the simulation result it is discovered that the bone structure has the highest energy absorption. At the velocity of 20 m/s, the structure absorbs 466590 J. However, the Cell Structure has the highest specific energy absorption. At the velocity of 20 m/s, the specific energy absorption is 34.77 J/g. Thus, the Cell Structure has the most optimum design in terms of lightweight structure.

Research limitations – This research is limited to the implementation of aluminium 6061 and 6005 and the velocity variation of 10 m/s, 15 m/s and 20 m/s. The energy absorption is limited to a single crash box structure not the assembled module.

Originality/value – Crash box structures were developed with inspiration from nature, such as horsetail, honeycomb, bone and cell structure.

Keywords: high speed train, bio-inspired, energy absorber, crashworthiness, LSYDNA

Room Mapping System for Small-Scale Industrial Autonomous Mobile Robots (AMR)

| Vincent Jonathan[1], Erwani Merry Sartika[2],

[1,2]Universitas Kristen Maranatha[1], Universitas Kristen Maranatha[2]

Abstract

Background – Mapping is of paramount importance for Autonomous Mobile Robots (AMRs) to efficiently transport goods from one location to another without human intervention. In a room mapping system, robot localization and speed control of each motor on the AMR are required. During the localization process, the robot occasionally experiences undesired location shifts or drifts on the map.

Purpose – Develop a Room Mapping System for Small-Scale Industrial Autonomous Mobile Robots (AMR)

Design/methodology/approach – These issues can be attributed to several factors, such as imperfections in the odometry system and slippage on the floor surface. To mitigate these challenges, this research integrates Visual Inertial Odometry (VIO) into the system. VIO combines visual data with inertial measurements to reduce the occurrence of drifts, thereby enhancing the robot's positional accuracy. Furthermore, during mapping experiments, discrepancies have been observed between the turning movements commanded by the control system and those executed by the robot. Such inconsistencies can lead to mapping errors, manifesting as distortions in the surface contours of the environment, including incorrect angles.

Findings – To address these issues, the research includes a detailed fine-tuning of the differential drive steering parameters, specifically focusing on the wheel radius and the distance between the wheels. These adjustments are crucial for improving the accuracy of room mapping by the AMR, ensuring that the robot can map environments.

Research limitations – This research uses an AMR that is both cost-effective and accessible for small industries. To achieve this, the mechanical and electrical designs of the AMR are based on readily available, modular components, while the software system leverages ROS2, an open-source middleware widely used in robotic applications.

Originality/value – Fine-tuning of the differential drive steering parameters, including wheel radius and the distance between the wheels, is conducted to improve the accuracy of room mapping for the AMR.

Keywords: Room Mapping System, Autonomous Mobile Robots (AMR), ROS2, Fine-tuning

Immobilization of Saccharomyces cerevisiae as An Advanced Approach Using Gellan Gum Phytagel Beads in Pomegranate Wine Production

Vrunal More[1], Prajakta Khule[2]

[1,2]SVERI's College of Pharmacy Pandharpur

Abstract

Background – Pomegranate wine may not be as widely known or produced as grape wines, its unique qualities and potential health benefits make it an intriguing option for winemakers and wine enthusiasts alike

Purpose – The goal of the current investigations was to standardise the steps involved in producing wine manufactured from pomegranates. The wine formulation is made by using pomegranates because the juice of pomegranates has a substantial amount of sugar, are rich in polyphenols, especially punicalagins as well as ellagic acid.

Design/methodology/approach – When yeast executes anaerobic fermentation, which transforms carbohydrates into alcohol and carbon dioxide, pomegranate wine is produced. Saccharomyces cerevisiae (NCIM 3287) was immobilized in sodiumalginate beads to produce a biocatalyst for use in pomegranate wine making. The immobilized biocatalyst was found to be suitable for pomegranate juice fermentation at ambient temperatures. The study included effects of alginate concentrations, initial bead loadings and bead diameters on fermentation. Pomegranate wine has an appealing colour and a respectable level of alcohol

Findings – The immobilized biocatalyst is operationally stable, which makes possible its use at commercial scale. Pomegranate wine making using yeast cells immobilized entrapped in sodium alginate spherical beads. Various physical factors like alginate concentration, bead diameter and cell loading play important role in the success of immobilized systems as all the factor has impact on the mass transfer rate of the substrate and product formed. In general, it was possible to achieve a complete fermentation of pomegranate juice with different experimental settings. This work poses the bases for future perfectioning of the fermentation process, thus opening new opportunities regarding under exploited market opportunitiesPomegranate wine has a good colour and a good amount of alcohol.

Research limitations – Automation and Process Optimization: Automated systems can monitor and adjust fermentation parameters, track yeast health, and optimize the overall process for improved efficiency and consistency. Cost optimization: Cost required for pilot plant with 1000 lit. capacity approx. 20 to 25 Lakhs.

Originality/value – Pomegranate of the Bhagwa kind was chosen for the creation of wine. Pomegranates from the Bhagwa variety were chosen to make wine after being evaluated for their nutritional value. As a biocatalyst for making wine, Saccharomyces Cerevisiae was immobilized in sodium alginate beads

Keywords: Pomegranate, Wine, Immobilization, Saccharomyces Cervisiae, Sodium alginate

Investigation and Optimization of Raster Angle to Reduce Energy Consumption and Carbon Footprint in 3D Printing

Fikri Abdulhakim Ichsan[1]

[1]Bandung Institute of Technology

Abstract

Background – The research focuses on additive manufacturing, specifically 3D printing, which has grown significantly in recent years. The study explores how various factors such as print quality, layer thickness, infill density, and raster angle affect the energy consumption and GHG. The emphasis is on understanding how these variables contribute to the overall environmental impact of 3D printing.

Purpose – The primary purpose of the research is to investigate and optimize the raster angle in 3D printing to reduce energy consumption and the carbon footprint. The study aims to explore the relationship between raster angle and energy efficiency, contributing to more eco-friendly 3D printing practices.

Design/methodology/approach – 1. Selection of 3D Printers and Raster Angle: There are 2 types of 3d printer and 6 various raster angle as an object of this research (0, 15, 30, 45, 60, 75) 2. Energy Measurement: The energy consumption (voltage) is measured every 2 seconds for each types of raster angle to see the fluctuations 3. Data Processing: The data is collected and calculated using statistics tools such as normality test, ANOVA, correlation test, and forecasting 4. Carbon Emission Calculation: To monitor the effect of 3d printer to the environment, the result of data processing is calculated using GHG calculation formula 5. Variation of Operating Parameters: This section discusses the variation of operating parameters such as layer thickness and infill density and their effects to the GHG 6. Analysis: Summarize the analysis methods used to interpret the data

Findings – The impact of raster angle on energy consumption and carbon footprint, showing how optimizing this variable can lead to more efficient 3D printing processes. The broader implications for eco-friendly 3D printing, suggesting that specific settings can significantly reduce environmental impact.

Research limitations – This research have limitations related to the scope of materials tested and the specific 3D printing technologies used.

Originality/value – The research contributes to the existing body of knowledge by focusing on a relatively underexplored aspect of 3D printing "raster angle optimization" and its potential to reduce energy consumption and carbon emissions. This study highlights the importance of process parameters in achieving sustainable manufacturing practices in the field of 3d printing.

Keywords: Raster Angle, 3D Printing, Energy Consumption, Carbon Footprint, Optimization

Designing an Ergonomic Egrek (Palm Oil Sickle) for Palm Oil Harvesting: A Quality Function Deployment and Iterative Design Approach

Hammam Yusdin[1], Retno Widyaningrum[2], Erwin Widodo[3], Ratna Sari Dewi[4], Berlian Al Kindhi[5], Widyastuti[6]

[1,2,3,4,5,6]Institut Teknologi Sepuluh Nopember

Abstract

Background – Indonesia, a country with vast palm oil plantations and a high production capacity, is known as the biggest palm oil producer in the world. However, Indonesia's productivity is relatively low, indicating the need for improved harvesting practices, especially in addressing ergonomic risks associated with the current harvesting practice and complying with the Indonesian national standard for egrek.

Purpose – This research focuses on designing and developing an ergonomic egrek (palm oil sickle) that complies with national standards and user needs. The study aims to improve harvesting efficiency and minimize injury risks.

Design/methodology/approach – This study implements Quality Function Deployment (QFD) to translate the harvester needs into engineering responses. The data was collected through interviews, ethnography, iteration evaluation, and Rapid Entire Body Assessment (REBA). This research involves constructing functional prototypes, including an egrek knife, stick, and connector clamp.

Findings – The prototype references the translated engineering responses and the iterative feedback responses. The egrek knife, designed with a knife angle of 103°, uses Japanese spring steel material processed through a rolling process to enhance its hardness and durability properties. The stick is made from aluminum to achieve cost efficiency while maintaining performance. It has an inner clamp for a more straightforward extending process and a quick-release clamp for a secure connection. The selection of material, shape, dimension, and function of each component is decided through the morphology chart. The current design successfully lowers the ergonomic risks of the harvester while maintaining compliance toward Indonesia's national standard of egrek.

Research limitations – However, the current analysis is only referenced through the product's conformity and the downstream effect observed from the harvester's behavior. Further physiological research is needed to evaluate the prototype objectively.

Originality/value – This research contributes to the palm oil industry by increasing the palm oil industry's productivity and improving the harvester's well-being. The QFD framework used in this research ensures that the developed design is centered on the user, fulfilling the basic needs of the palm oil harvester. The performance of the egrek, which is comparable to the existing commercial product, also demonstrates the potential to substitute the egrek market in Indonesia.

Keywords: Egrek, Harvester needs, Iteration Process, Palm oil harvesting, Quality Function Deployment.

Track: Supply Chain Management

Pricing and Order Queue Decisions for New and Remanufactured Products under Duopoly Competition in a Circular Supply Chain

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Abstract

Background – This study explored pricing and order queue decisions in a circular supply chain. With a growing focus on environmental sustainability in business, two duopolistically competing manufacturers offer two different products, including new and remanufactured products.

Purpose – This study aims to determine the optimal decisions for pricing and ordering queues to maximize profit for each manufacturer. We investigated how the selling price in the demand function is influenced not only by its price but also by competitors' prices. We also emphasized the pivotal role of the order queue in determining product inventory, represented by the order interval.

Design/methodology/approach – This research performed a quantitative method in the operational research. Initially, we structured the demand and profit functions for each manufacturer. By developing a Nash equilibrium model, we solved the game theory problem and generated the optimal decision for pricing and order intervals. Afterward, we conducted a numerical analysis to obtain optimal decisions and profits for each manufacturer. We also examined the effect of some parameters on the optimal decision variables, such as the holding cost, wholesale price, and order interval. We assumed the manufacturer selling remanufactured products has lower costs and demands.

Findings – The numerical results confirmed that the optimal prices and profits for the manufacturer selling new products are higher. The sensitivity analysis demonstrated that increasing the selling price and order interval will reduce the manufacturer's profit. Furthermore, increasing the wholesale price and holding cost will decrease the order interval, increase the selling price, and ultimately reduce profit.

Research limitations – This study has several limitations. First, this study only examined the optimal pricing and order queue decision under duopoly competition. Second, the investigated supply chain members were limited and have perfect information. Third, this research discussed products sold in one period.

Originality/value – This study has some theoretical and practical implications. For theoretical implications, it contributes to operation research, decision analysis, and supply chain management literature. Meanwhile, we generated managerial insights to demonstrate the practical implications. The managerial insights summarized that it is imperative for a manufacturer to determine the optimal selling price and order interval to gain a competitive advantage when making pricing and order queue decisions.

Keywords: Circular economy, game theory, pricing strategy, remanufacturing, supply chain design

Track: Management Science

Preserving the Angkringan Culture in Indonesia

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Abstract

Background – This study is unique in that it combines SSM, Servqual, and Kano Model, employs both qualitative and quantitative approaches, and is applied to an angkringan in Ambarawa, Indonesia. This study is also unique in preserving the angkringan culture, the old traditional culture in Indonesia, especially in Central Java.

Purpose – The goal of this study, in relation to the angkringan's status, is to assist Angkringan Senopati in Ambarawa in maintaining its sustainability. This post will assist the angkringan in increasing revenue while also ensuring that clients come from diverse backgrounds.

Design/methodology/approach – The soft system methodology (SSM), in conjunction with service quality (servqual), and the Kano Model were used to overcome the challenges. SSM was used to gather information related to the condition of the angkringan, problems that occur and possible solutions. The Servqual approach was used to assess service quality based on customer satisfaction and to identify gaps that lead to customer discontent. Furthermore, the Kano model was used to determine the variables that affect customer dissatisfaction.

Findings – According to observation and study, the majority of angkringan visitors were young people since angkringan promotions were carried out on social media, which older people rarely utilize. Other factors were that the angkringan was located on a quiet street, while the signboard was small and unattractive. According to the conclusions of Servqual and Kano, there are eight variables that improving focus. The eight variables include food taste, convenience of parking, employee responsiveness, gathering comfort, angkringan cleanliness, air circulation, lighting quality, and furniture comfort.

Research limitations – This study can be broadened by looking at other angkringan to draw more general conclusions. Other research can also be conducted using different methods or combining more methods to solve the problem.

Originality/value – This study is unique in that it combines SSM, Servqual, and Kano Model, employs both qualitative and quantitative approaches, and is applied to an angkringan in Ambarawa, Indonesia. This study is also unique in preserving the angkringan culture, the old traditional culture in Indonesia, especially in Central Java.

Keywords: angkringan, egalitarian, Kano Model, service quality, soft system methodology

ISO 9001:2015 and Lean Six Sigma: A Systematic Literature Review

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Abstract

Background – The dynamic market and evolving environmental requirements present significant challenges for organizations striving to maintain effective quality management and process efficiency. This paper explores the integration of ISO 9001 requirements with Lean Six Sigma, focusing on the difficulties in achieving synergy between operational and managerial performance.

Purpose – The research aims to analyze existing literature on the integration of Lean Six Sigma and ISO 9001 requirements to identify gaps and opportunities for further exploration. Specifically, it seeks to uncover areas lacking a cohesive framework for their combined application in quality management and operational performance.

Design/methodology/approach – Employing a systematic literature review, this study investigates the strategic integration of ISO 9001 requirements with Lean Six Sigma. A thorough search was conducted using keywords such as "ISO 9001" AND "Lean Six Sigma," focusing on publications from 2015 to 2024. A total of 10 relevant scientific articles were reviewed, sourced from reputable databases Dimensions and Scopus. Data analysis involved categorizing findings to identify trends, gaps, and areas for future research.

Findings – The review identified a notable lack of case studies examining the practical adoption and outcomes of combining ISO 9001 with Lean Six Sigma methodologies. Another significant gap was the absence of research on how the 2024 amendment of ISO 9001, concerning climate-related actions, affects the integration of LSS with the updated standards. This presents an opportunity for future research to address these gaps by offering new insights into the practical application and effectiveness of integrating LSS with the latest ISO 9001v 2015 standard.

Research limitations – The study is limited by its focus on literature published between 2015 and 2024, which aligns with the most recent ISO 9001 standards but may exclude earlier foundational research. Additionally, although two databases were used to extend the literature review, this scope may still be insufficient for capturing a global perspective, potentially affecting the generalizability of the findings.

Originality/value – This research not only addresses a gap in the current literature but also offers valuable insights for organizations seeking to align with the latest standards, thereby improving the relevance and application of Lean Six Sigma methodologies in today's evolving business environment.

Keywords: ISO 9001, Lean Six Sigma, Quality Management System, Operational Performance.

Track: Management

A New Combination of Dynamic Value Stream Management and Cost Time Profile Design for A Paper Industry

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Abstract

Background – Value stream mapping (VSM) in lean manufacturing has been applied widely and contribute significantly for increasing manufacture efficiency. However, VSM tool describe static process and in reality many manufacturing processes are dynamic. Therefore some researchers try to introduce dynamic value stream mapping for dynamic process. The tool can be used to describe value added and non value added activities and then reduce time. In some manufactures, time is not related with cost. Shorter processing time can result in higher cost. In this case, it is not enough to consider time only, but also cost.

Purpose – This research try to develop a new tool by combining dynamic value stream management and cost time profile. The tool is developed and implemented in a paper industry and controlled using dashboard to give information about performance of the process and help decision making.

Design/methodology/approach – The new tool is developed and validated in a paper industry. In the first step current VSM and cost time profile (CTP) are developed for paper processing from demand planning up to delivery to customer. The next step, analysis of value added and non value added activities is conducted using 7 waste analysis. Then the waste causes are analyzed using 5 why's analysis. Future DVSM and CTP are developed by eliminating the wastes. As a management processes, the future DVMM and CTP are monitored using a relevant dashboard.

Findings – The result of the this research is a new combination tool of DVMM and CTP that is implemented in a paper industry. After few months controlling processes, some interesting results are found. Compare to current situation, the management analysis shoe that lead time decrease up to 34% and cost decrease up to 13%

Research limitations – The model development and implementation only used in one paper manufacture. Development and implementation of the model to other industries that is more dynamic than manufactures such as logistics and health care will be interesting.

Originality/value – There are few models to capture dynamic time and cost in lean manufacturing, therefore this research offer a new model that combine time and cost analysis in lean concept and a tool to support management decision.

Keywords: VSM, DVMM, CTP, Lean, dashboard

Tourism Innovation Through Co-Creation: How Trust, Experience, and Innovativeness Drive Tourist Participation

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Abstract

Background – Background: Tourism plays a significant role in Indonesia's economy, attracting millions of tourists annually. However, the COVID-19 pandemic severely impacted international arrivals, highlighting the need for innovative strategies to enhance the tourism sector's resilience and competitiveness.

Purpose – Purpose: This study aims to explore the factors influencing tourists' interest in co-creation within tourism experiences in Indonesia. Specifically, it examines the roles of trust, experience, and innovativeness, as well as the impact of engagement on tourists' intention to co-create, providing a deeper understanding of tourist behavior.

Design/methodology/approach – Design/Methodology/Approach: The research employs a quantitative approach, collecting data through a structured questionnaire survey of 400 international tourists across five key tourism clusters in Indonesia: Bali, Jakarta, Yogyakarta, Lombok, and Komodo. The data were analyzed using Structural Equation Modeling (SEM) with Partial Least Squares (PLS-SEM) to test the relationships between variables.

Findings – Findings: The findings reveal that higher levels of trust and positive experiences significantly enhance tourists' willingness to engage in co-creation. Innovativeness also plays a crucial role in driving tourists' interest in co-creation. These insights underscore the importance of co-creation as a key innovation to boost competitiveness and address challenges in the tourism industry. The study provides valuable guidance for tourism businesses and policymakers in designing strategies to improve Indonesia's tourism competitiveness by fostering trust, enhancing experiences, and encouraging innovativeness among tourists.

Research limitations – Research Limitations: The study focuses on five key tourism clusters in Indonesia, which may limit the generalizability of the findings to other regions or countries. Additionally, the cross-sectional design captures data at a single point in time, limiting the ability to observe changes over time. The reliance on self-reported data may also introduce response biases.

Originality/value – Originality/Value: This study addresses significant gaps in the literature by focusing on co-creation in a developing country context and providing a comparative analysis with developed countries. It identifies specific motivators for tourist co-creation interest, offering practical recommendations for enhancing tourist engagement and satisfaction. The insights from this research contribute to the development of more effective and sustainable tourism strategies, enhancing the overall attractiveness and competitiveness of tourism destinations.

Keywords: Co-Creation, Trust, Innovation, Competitiveness, Tourism industry

Dynamic Simulation Model for Investigating the Potential Development of Wind Power Plants to Increase Fulfillment Ratio

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Abstract

Background – Renewable energy is an unlimited alternative energy source that will not be depleted, even with continuous use. Wind energy remains underutilized. According to the 2021-2030 Electricity Supply Business Plan Report of the State Electricity Company, Banyuwangi is a potential site for a Wind Power Plant (WPP). The increasing population in Banyuwangi has led to a growing demand for electricity, while fossil fuel reserves, such as oil and coal, are dwindling.

Purpose – This research aims to analyze the potential of wind energy development in improving the electricity fulfillment ratio using a system dynamics model

Design/methodology/approach – The model was developed using a Causal Loop Diagram and Stock and Flow Diagram and was tested through Behavioral Validation using Mean Comparison (E1) and Percentage of Error Variance (E2).

Findings – This study developed a "Do Nothing" scenario and a Horizontal Axis Wind Turbine (HAWT) scenario. Results indicate that HAWT turbines can generate 69,491 kWh of electricity and increase the fulfillment ratio by approximately 1.1%.

Research limitations – This study examines on the utilization of alternative energy, specifically wind energy, in Banyuwangi Regency.

Originality/value – This research is expected to provide insights for developing dynamic system models in the renewable energy context and offer practical recommendations for policymakers at the State Electricity Company in developing wind power plants.

Keywords: Wind Power, Alternative Energy, Wind Turbine, Model, System Dynamics

Track: Production & Planning Control

Tool Wear Monitoring in Hard Turning Using Sensor Fusion : An Analytical Approach

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Abstract

Background – At present, the life expectancy of tool has become a vital aspect in the manufacturing industries, especially where materials with high hardness has more importance.

Purpose – Nowadays hard steel has been widely used for manufacturing of commercial parts in military aircrafts, car systems and hydraulic tools, etc. Manufacturing industries, mainly concentrates on mass production of the products with precision and accuracy. In such cases the continuous machining may weaken the tool causing tool wear which ultimately affects the quality with production rate.

Design/methodology/approach – To avoid such an unwanted scenario, the different tool wear prediction techniques have been introduced which uses cutting force signals or average chip-tool interface temperature or surface roughness signals, etc. According to the literature, different techniques are available for the pre-judgment of the tool wear shows variation in the accuracy of prediction. Sensor fusion technique can be employed to overcome this problem by combining data from different sensors intelligently to improve the process. Sensor fusion uses this combine data to correct deficiencies of individual sensor and predict, the tool wear accurately which compensate for the sudden breakage of tool in real life applications.

Findings – In this paper, a new approach of tool wear prediction has been introduced to correlate different available sensor by using sensor fusion technique. Also a mathematical approach has been derived for the sensor fusion purpose. The experimentation has been carried out using coated carbide inserts on 55 HRC hardened steel.

Research limitations – The methodology proposed is limited to a set of combination of particular materials. This can be extended to numerical simulations for various set of materials.

Originality/value – Multiple sensor data fusion approach has been utilized for real time monitoring and control.

Keywords: Sensor fusion, tool wear monitoring, artificially worn out tools, signal processing

Track: Information Technology

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Advancing Sugarcane Farm Management through NDVI-Based Color Mapping and Drone Imaging

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Abstract

Background – Precision agriculture, utilizing remote sensing and data-driven approaches, offers innovative solutions to these challenges. This study explores the application of the Normalized Difference Vegetation Index (NDVI) combined with drone imagery to revolutionize sugarcane farm management, providing farmers with actionable insights to optimize crop health and yields.

Purpose – By integrating high-resolution drone imaging and advanced data analysis, the study seeks to create detailed visual representations of crop health which will empower farmers to make informed decisions, addressing specific issues such as nutrient deficiencies or irrigation needs.

Design/methodology/approach – This study uses drone imaging and NDVI-based color mapping to improve sugarcane farm management. High-resolution, multispectral images of the fields are captured using drones like the DJI Phantom 4, focusing on visible and near-infrared spectral bands essential for NDVI (Normalized Difference Vegetation Index) calculations.The captured images are stitched together using software such as QGIS or WebODM to create panoramic views of the farm. These comprehensive visual representations are then analyzed to calculate NDVI values by comparing red and near-infrared reflectance, which assess vegetation health.The calculated NDVI values are used to generate color-coded maps, which visually indicate varying levels of vegetation health across the farm.

Findings – The study successfully captured high-resolution drone images and meticulously stitched them into detailed panoramic views, ensuring that no critical data was lost in the process. This comprehensive visual overview allowed for an accurate NDVI (Normalized Difference Vegetation Index) analysis, which effectively assessed vegetation health, with higher values clearly indicating healthier plants. The color-coded maps provided clear visual indicators of crop health, enabling farmers to quickly identify problem areas.

Research limitations – The study noted that environmental factors, such as changes in lighting or weather, could impact the accuracy of NDVI calculations. Additionally, non-vegetative elements like soil or water might skew NDVI results, highlighting the need for careful calibration.

Originality/value – This research demonstrates the use of NDVI for sugarcane farm management, integrating cutting-edge drone imagery and advanced data analysis. By offering precise color mapping of vegetation health, it advances precision agriculture and supports sustainable farming practices.

Keywords: NDVI (Normalized Difference Vegetation Index), Precision Agriculture, Drone Imaging, Vegetation Health, Color Mapping

Breast Cancer Diagnosis with Elastography Images Using Image Processing and Machine Learning

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Abstract

Background – New medical imaging techniques, Elastography and B-mode ultrasound, are used in combination to distinguish between cancerous and noncancerous breast lumps based on their stiffness and shape.

Purpose – The main health problem these days has led to a lot of progress in medicine, but there are still some illnesses that can't be cured. In the early stages of some diseases, it seems even harder to figure out what they are.

Design/methodology/approach – Image processing methods are applied to extract relevant features from the images, and data preprocessing and Principal Component Analysis (PCA) are used to reduce the dimensions of the information. A supervised learning algorithm called Support Vector Machine (SVM) is employed to categorize the combined elastogram and B-mode images into different groups. K-fold cross-validation is used to ensure the method's applicability in various scenarios.

Findings – The accuracy, confusion matrix, and logistic loss of the chosen method are then evaluated. When SVM is used with the Radial Basis Function (RBF) kernel, the highest classification accuracy achieved is 94.12%.

Research limitations – CNN (Convolutional Neural Network) can be used for Deep Learning because it reduces the number of dimensions of input pictures without affecting their quality. This means that the amount or size of input can be improved while the quality of the images is not affected. It is possible to add these methods to the system program in order to get better results in the future.

Originality/value – 90% original

Keywords: Elastography, B-mode ultrasound, Breast lesions, Support Vector Machine (SVM), Principal Component Analysis (PCA)

Augmented Reality in T-shirt Retail: Understanding User Engagement and Purchase Intention through Instagram Filters

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Abstract

Background – With the rapid growth of mobile shopping, AR has emerged as a promising technology that enhances the shopping experience by merging the digital and physical worlds.

Purpose – Explores the impact of augmented reality (AR) features on consumer behavior, particularly focusing on Instagram filters in the T-shirt retail industry.

Design/methodology/approach – This study uses Instagram filters from an account named Apprecio to test a hypothesis with 105 online respondents who will use the filters on their mobile devices. Their responses will be analyzed using the partial least squares method.

Findings – Findings indicate that while perceived augmented reality, vividness, and hedonic factors contribute to the overall user experience, they do not significantly influence purchase intention or repeated usage. Instead, interactivity and utilitarian aspects are more effective in driving consumer engagement and sales.

Research limitations – The study is limited by its small sample size, narrow focus on Instagram filters within the T-shirt retail industry, and lack of detailed exploration of specific interactive AR features.

Originality/value – The originality and value of this study focused on an on an examination of the role of augmented reality (AR) features, specifically Instagram filters, within the T-shirt retail industry.

Keywords: Augmented Reality (AR), Instagram Filters, Purchase Intention, Mobile Shopping

Red-Green-Blue (RGB) Image Classification Using Deep Learning for Predicting Sugarcane Crop Age

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Abstract

Background – Monitoring sugarcane growth stages traditionally involves manual processes that are both time-consuming and prone to errors. In light of these challenges, this study explores the application of deep learning techniques to automate and improve the accuracy of crop monitoring, specifically focusing on the classification of sugarcane growth stages.

Purpose – In this research a deep learning-based system that leverages high-resolution drone imagery for precise sugarcane age classification has been developed for accurately identifying the growth stages of Sugarcane

Design/methodology/approach – The study is structured around the systematic capture of high-resolution drone images at various stages of sugarcane growth. These images are carefully stitched together to create a comprehensive dataset, followed by segmentation to isolate key areas of interest for further analysis. The ResNet-50 deep learning architecture, augmented with an additional fully connected layer, is then utilized to recognize and classify intricate patterns associated with different growth stages. The model is rigorously trained on cropped sections of the segmented images to ensure it can effectively identify subtle growth-specific features. To assess the model's effectiveness, its performance is compared against alternative deep learning architectures such as GoogLeNet and VGG. This comparative analysis confirms the superior accuracy and robustness of the ResNet-50 model in detecting sugarcane growth patterns.

Findings – The research findings demonstrate that the enhanced ResNet-50 model significantly outperformed other architectures, achieving an impressive 91% accuracy in classifying sugarcane growth stages. This underscores the model's effectiveness in agricultural image analysis and highlights the potential of deep learning techniques to revolutionize precision agriculture by providing a robust framework for future advancements in crop monitoring.

Research limitations – The dataset used in this study is based on drone images from specific sugarcane fields, which may limit the generalizability of the results across different regions and environmental conditions.

Originality/value – This study is a pioneering effort in using deep learning for sugarcane age classification through high-resolution drone imagery. By achieving a 91% accuracy rate, the research not only demonstrates the significant potential of such techniques in enhancing crop monitoring but also sets a new benchmark in the field of agricultural image analysis.

Keywords: Deep Learning, ResNet-50, Sugarcane Age Classification, Precision Agriculture, Agricultural Image Analysis??

A Dynamic Simulation Model for Enhancing Rooftop Solar Power Plant Utilization

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Abstract

Background – Renewable energy is energy derived from unlimited and inexhaustible natural resources, even when used continuously, with solar energy having great potential in Indonesia. East Java is one of the provinces with the greatest potential for Rooftop Solar Power Plants, but its utilization is still minimal.

Purpose – This study aims to develop a model and scenario to increase the fulfillment of renewable energy through Rooftop Solar Power Plants in East Java using a dynamic system simulation model.

Design/methodology/approach – System modeling is conducted using Causal Loop Diagram and Stock and Flow Diagram, then simulated for several years to come to project the increase in the use of Rooftop Solar Power Plants through the model scenario.

Findings – In this study, a scenario for providing incentive policies was developed. The results of simulating the model scenario show an increase in the fulfillment ratio up to 0.277% by 2035.

Research limitations – This study focuses on rooftop solar PV development in East Java.

Originality/value – This study is expected to provide policy strategy recommendations to the government to increase the utilization of Rooftop Solar Power Plants.

Keywords: Renewable Energy, Solar Power, System Dynamics, Model, Sustainable

Track: E-Business

Consumer Privacy Concerns and Acceptance of AI-Driven Marketing in Indonesian E-commerce

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Abstract

Background – The rapid adoption of AI-driven marketing in Indonesian e-commerce has raised significant consumer privacy concerns. This study examines the delicate balance between innovative AI marketing practices and the protection of consumer data.

Purpose – This research aims to explore the level of consumer awareness, perceived benefits and risks, and acceptance of AI-driven marketing within the context of Indonesian e-commerce.

Design/methodology/approach – A structured quantitative approach was employed, involving a survey distributed to a representative sample of Indonesian e-commerce users. Statistical tools, including descriptive and inferential analysis, were utilized to interpret the data.

Findings – The study found high levels of consumer awareness and concern regarding data privacy, which significantly impact trust and acceptance of AI-driven marketing. Consumers are particularly wary of data privacy risks, despite acknowledging the benefits of personalized AI interactions.

Research limitations – The study's scope is limited to Indonesia, and the findings may not be directly applicable to other regions with different socio-cultural and technological contexts.

Originality/value – This research provides valuable insights into the specific concerns and acceptance levels of Indonesian consumers regarding AI in e-commerce, filling a gap in predominantly Western-focused literature. It offers strategic recommendations for enhancing consumer trust in AI-driven marketing by emphasizing transparency, robust data protection, and clear communication.

Keywords: AI-Driven Marketing, Consumer Privacy, E-commerce, Indonesia, Data Protection

Escapism: Escape Theory of Skipping Class on Gen Z Students in Greater Bandung

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Abstract

Background – The phenomenon of students solving problems by running away has been widespread nowadays. The "tolerance of absences" is something that is often misused. Students use the excuse of skipping classes simply to avoid inconvenient situations, such as killer lecturers, presentations, etc. We explored the literature on escapism and looked for various factors that could cause escapism, especially skipping class behavior.

Purpose – In the light of the coping mechanism theory, the development of variations in human behavior as a coping mechanism has encouraged the presence of this paper, which aims to measure the level of escapism as a choice of coping strategy in understanding the phenomenon of skipping classes among students as Generation Z with an escapism theory.

Design/methodology/approach – This study used three analytical approaches: content validity involving ten subject matter experts (Clinical psychologists), confirmatory factor analysis (CFA), and reliability analysis. For the reliability and CFA approach, 300 students were used as samples, which were taken through convenience sampling technique.

Findings – Evidence based on validity is carried out using confirmatory factor analysis, proving that the measurement model fits the available data. Thus, it can be continued by testing the significance of each item's contribution to the escapism construct by referring to the standardized loading factor (SLF) and t-value. The analysis found that all items had a positive SLF and t-value > 1.96, indicating that all 20 items compiled were significant in measuring the escapism construct. The analyzed psychometric aspect is also reliable, with a coefficient of 0.902 (> 0.70). Based on evidence of validity and reliability, the escapism measuring tool is psychometrically adequate.

Research limitations – The escapism measuring tool is prepared based on behavioral norms in Greater Bandung. This measuring tool was designed only to measure the level of escapism of undergraduate students actively studying.

Originality/value – Based on the search, other articles discussed escape in other contexts, such as purchasing, internet, eating, etc. However, research has yet to be found that discusses skipping classes as a phenomenon. Therefore, researchers want to raise escapism in the context of skipping class.

Keywords: Escapism, Coping Strategy, Psychometrics, Reliability, Content Validity

Track: Safety Engineering

Crashworthiness Analysis of Trailer Structure of Indonesian High Speed Train

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Abstract

Background – There are 2 safety systems installed on high speed train, i.e. active safety system and passive safety system. While the passive safety system was already employed, there are still many cases of train collisions that cannot be avoided.

Purpose – The purpose of this research is to evaluate the first developed Indonesian high-speed train (HST) trailer design compliance with crashworthiness standard (SNI 8826 and EN 15227).

Design/methodology/approach – This research use quantitative method through a numerical crashworthiness analysis using ANSYS - LS DYNA software. The object of research is the first Indonesian high-speed train (HST) trailer developed by PT INKA. The analysis was carried out by the case of collision between a train and a rigid wall at the velocity of 36 km/h (equivalent to 10 m/s) regulated by BS EN 15227:2008. The structure was simplified in form of surfaces. The material used was Aluminum 6005A-T6 with Johnson–Cook material model to define high strain rate properties. The connection between the parts of structure was defined by share topology and bonded contact. With this simulation, the data i.e. deformation length, total energy absorption, and deceleration pulse was collected. The data was validated by evaluating the hourglass energy . Typically, the hourglass energy maintained under 10% from the total energy.

Findings – From the simulation result, we obtain that the deformation in the survival space is 49 mm, the total kinetic energy absorbed by the structures is 2.6 MJ, and the maximum wheelset displacement is 81 mm. These value is acceptable by the standard. But the average deceleration pulse reaches 11.12 g. This value is much higher than the acceptable value which is 5g.

Research limitations – This research has the limitation in parameter. The crash velocity regulated by the used standard was 36 km/h while most the actual crash velocity was above 100 km/h. The next limitation is the object. The evaluated object is under development progress which means its model may change again.

Originality/value – With this research, the safety awareness of the first Indonesian HST Trailer was evaluated. The result can help for the further crashwortiness implementation reseacrh e.g. crash zone area and impact module application.

Keywords: Crashworthiness, Vehicle Safety, Occupant protection, High-speed Train, Crash Energy.

Track: Ergonomics

Optimization of Work Posture PT. Xyz: Analysis of Rapid Entire Body Assesment (Reba) Method to Improve Health and Productivity

| Nismah Panjaitan[1], Niken Kristin Silitonga[2], Muhammad Zaky Faris[3], Juni Arta Lubis[4]

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Abstract

Background – Due to inadequate ergonomics, PT.XYZ is experiencing productivity issues. REBA is used in this study to evaluate hazards and suggest enhancements.

Purpose – To enhance worker health and productivity, PT. XYZ should evaluate and correct work postures.

Design/methodology/approach – The REBA Approach

Findings – generates boiler sticks

Research limitations – Examining a mere three departments' worth of brief info.

Originality/value – Gives comparable industries a model.

Keywords: Ergonomics, Rapid Entire Body Assessment (REBA), Musculoskeletal Disorders, Work Posture, Productivity.

Workload Analysis Using Heart Rate Parameters: A Quantitative Approach in Measuring Energy and Cardiovascular Response in Operators at pt.x

| **Nismah Panjaitan[1], Juni Arta Lubis[2], Niken Kristin Silitonga[3], Muhammad Zaky Faris[4]**

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Abstract

Background – At the glycerin station, PT.X personnel report feeling worn out from their labor. assessing workload and adding personnel from outside the company.

Purpose – examining the burden of operators.

Design/methodology/approach – Energy use, CVL, and the Brouha technique.

Findings – heavy workload and staff expansion.

Research limitations – One-time measurement and glycerin. Workload-reducing practical methods at the glycerin station.

Originality/value – Workload-reducing practical methods at the glycerin station.

Keywords: Workload, energy expenditure, cardiovascular load (cvl) ,brouha.

Track: Operation Research

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Applications of Lambert-W Function in Industrial Technology Problems

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Abstract

Background – Mathematical modeling is often used in industrial technology to transform real problems into mathematical equations. These equations provide invaluable tool for examining complex data structures, understanding complex systems, making predictions from complex systems, simplifying complexity, and building simulations to prescribe better ways in optimizing the systems related to the real problems. In many cases, we often end up with the tasks of solving equations in which the unknown quantity occurs in a complicated manner, due to the complexity of the real problems. It is important to find appropriate method to deal with these complexity. There are few mathematical methods available, one of them is by converting the resulting mathematical equations into one that can be solved by the Lambert-W function. We will study the review on the applications of the Lambert-W function on problems arising in industrial technology.

Purpose – The purpose of the study is to undertake a systematic literature review with the aims to identify, evaluate, and find the gap in the topic (application of Lambert-W Function).

Design/methodology/approach – We will do the review by following the Preferred Reporting Items for Systematic reviews and meta-analyses (PRISMA) methodology. Sufficient data will be drawn from reputable databases, such as Scopus and Dimensions, with specific keywords, such as "Lambert-W Function" AND ("Industrial Technology" OR "Industrial Engineering"), for the period 2014 to 2024. This will result in a final selection of some high rank articles for the analysis. We also will combine the PRISMA with content analysis of those selected articles.

Findings – The expected results of the analysis are the state of the arts on the applications of the Lambert-W function in industrial technology and operation research together with the gaps that needs to be explored and fulfilled for the future research direction.

Research limitations – The limitation of the work is its dependency on the data bases being used in the PRISMA methodology. However, this could be compensated by the used of reputable databases.

Originality/value – It is also possible to identify a hotspot of research topics an groups that could be regarded as an original contribution of the work in this paper.

Keywords: Lambert-W function; Mathematical Model; Batteries Aging Modeling; Solar Cell Modeling; Manufacturing system

Optimal Strategy of Battery Electric Bus Maintenance Contract

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Abstract

Background – Electrification of transportation and the utilization of sustainable fuels is one of the methods for decarbonizing land transport. This aligns with Indonesia's target of achieving net-zero emissions by 2060 as a commitment to keeping the global temperature below 1.5°C. The use of Battery Electric Buses (BEBs) as part of transportation electrification has been implemented by Indonesian public transport in Jakarta, Bandung and Surabaya regions.

Purpose – The goal of this research is to determine the options offered and the characteristics of each option (price) and to identify the best option that supports achieving the business objectives for both manufacturer and BEBs operators or the users.

Design/methodology/approach – Manufacturers of BEBs typically offer several types of maintenance contracts for preventive and/or corrective maintenance. The study is conducted from the perspectives of both BEBs operators or the users and manufacturer. The initial step involves modeling each maintenance contract option based on performance metrics and profit. The modeling considers battery capacity degradation using Eyring-Weibull formulation to model BEB failures, which may involve usage rates, temperature conditions, and other factors such as voltage stress, state of charge (SoC) into the failure rate function. It is used to estimating battery life measure and availability. We introduce a non-fix price maintenance contract model which consider availability and penalty for both players. We model the decision problems for the manufacturer and the user which maximize the profit for both parties.

Findings – The research results will be in the form of a new decision model and optimal decisions that maximizing the expected profit for both parties using a Nash game theory formulation.

Research limitations – The estimation of Eyring-Weibull parameters are based on BEBs Bandung region.

Originality/value – This research provides some contributions - (i) modeling the battery degradation which considers two stress factors - temperature and SoC, and (ii) a non-fix price maintenance contract model which consider availability and penalty for both players . Future research will extend the BEV degradation model to account for both calendar aging and cycle aging, and the investigation of this research topic is ongoing.

Keywords: Battery Electric Bus, Nash Game Theory, Degradation Model, Eyring-Weibull formulation

A Business Model of Product-Service Systems for Battery Electric Vehicles

| Bermawi Priyatna Iskandar[1], Rachmawati Wangsaputra[2], Nur Faizatus Sa'idah[3], Muhammad Akbar[4], Hennie Husniah[5]

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Abstract

Background – The growth in electric vehicle (EV) sales over the past decade was slow, particularly in Indonesia. The primary barrier to market penetration was the high price of EVs, driven largerly by expensive batteries, which accounted for 40% of the vehicle's price. Offering an EV with a leased battery was expected to significantly reduce its price, helping to increase market penetration.

Purpose – This research aimed to propose the use-oriented product service systems (i.e., a lease contract (LC)) for a battery electric vehicle (BEV), to reduce EV prices and enhance EV market penetration.

Design/methodology/approach – The study adopted a PSS business model framework to incorporate outcomes desired by both the costumer and the manufacturer. We modeled battery degradation, price discount, payment scheme, costs and revenues for the LC. Battery degradation was modeled under two stress factors – temperature and state of charge (SoC) – using the Eyring-Weibull formulation. Hypothetical data from prior research on EV battery performance were used. We introduced a price discount scheme offering more discount for longer periods (m), expected to increase EV demand. We proposed two payment schemes - annual and monthly - providing flexibility for lessees. Data analysis used industry benchmarks, with validation through sensitivity analysis. Numerical results based on revenues and costs were obtained, with the lease period m and price P as decision variables. We modeled the decision problems for the manufacturer (as a lessor) and the consumer (a lessee) to maximise profit for both parties.

Findings – The optimal solutions (decisions) obtained through joint optimization and Nash game theory, demonstrated how both consumers and manufacturers could achieve profit maximization for both parties.

Research limitations – This study was limited to theoretical modelling of battery degradation and payment schemes. Future work would involve empirical validation and the inclusion of factors like battery recycling and second-life applications.

Originality/value – This research made several contributions: (i) it modeled battery degradation considering two stress factors (temperature and SoC), and (ii) it integrated a price discount based on the lease period. This approach provided a novel way to lower EV prices and enhance market penetration. Ongoing research would expand the BEV degradation model to include both calendar and cycle aging.

Keywords: Battery Electric Vehicle Modelling, Failure Modelling, Eyring-Weibull Distribution, Joint Optimization, Nash Game Theory.

CLOSING SPEECH

Your Excellencies, Presenters, and Attendees,

Ladies and Gentlemen,

It is a great honor for me to deliver the closing remarks for The 2nd International Conference on Industrial and Systems Engineering, Technology, Innovation, and Management (2nd ICISETIM), organized by the Bachelor Program in Industrial Engineering, Universitas Kristen Maranatha in collaboration with the Research Synergy Foundation. The conference was supported by several partners, including Scholarvein, Reviewer Track, Research Synergy Institute, Research Synergy Press, and F1000 Research. The committee successfully managed the event, with academic presentation sessions and presentations proceeding smoothly with minimal technical challenges. I believe this conference has provided us all with meaningful discussions and valuable opportunities to share our research findings.

Throughout this conference, we have explored diverse fields such as System Engineering, Technology, Innovation, and Management, with a particular emphasis on emerging areas like Big Data and Cloud Computing Applications. These topics are increasingly significant in today's rapidly evolving digital landscape. The discussions and presentations have underscored the profound impact of these advancements on industries and businesses. I am especially impressed by the level of enthusiasm and active participation from all attendees and presenters, which has greatly contributed to the overall success of this event.

I would like to extend my heartfelt thanks to all participants, keynote speakers, reviewers, presenters, attendees, and session chairs from various countries who contributed their expertise to this 2nd ICISETIM. Special thanks also go to the organizing committee for their tireless efforts in ensuring the smooth execution of the event. As we move forward, I hope that the energy, enthusiasm, and shared commitment demonstrated here will propel us toward a better future for all.

Congratulations to the recipients of the Best Paper and Best Presentation awards, and a special acknowledgment to all the session chairs for their valuable feedback. We look forward to future collaborations.

In conclusion, I thank you all for your contributions. I hope the knowledge shared, the new connections made, and the friendships formed during this conference will benefit us in our professional journeys ahead.

We look forward to seeing you at our next event. Please stay in touch, and thank you for your attention. Stay safe and healthy.

Best regards,

Victor Suhandi, S.T., M.T., Ph.D.
Head of Bachelor Program in Industrial Engineering, Universitas Kristen Maranatha, Indonesia

Future Events

https://bit.ly/UpcomingConference-RSF

ISTILMA

International Conference on Islamic Studies, Law and Management
https://istilma.com
Virtual Conference
October 15, 2024

5th ICIE

The 5th International Conference on Islamic Epistemology
https://icie-uai.com
Virtual Conference
October 23-24, 2024

2nd ICE-BEST

2nd International Conference on Economics, Business, Science, and Technology
https://ice-best.com
Hybrid conference (Ramada Plaza By Wyndham Istanbul City Center, Istanbul, Turkey)
October 30-31, 2024

9th MASOS

9th International Conference on Management Studies and Social Science
https://www.masosconference.com
Virtual conference
November 5, 2024

2nd ICP-IBS

The 2nd International Conference on Psychology and Interdisciplinary Behavioral Studies
https://icpibs.com
Virtual Conference
November 12-13, 2024

2nd ICANEAT

2nd International Conference on Artificial Intelligence, Navigation, Engineering, and Aviation Technology
https://icaneat-apibanyuwangi.com
Hybrid conference (API Banyuwangi Campus, Banyuwangi, Indonesia)
November 22, 2024

UINACEB

UIN Annual Conference on Economics and Business
https://uinaceb.com
Virtual Conference
November 29, 2024

JICRISD 2024

Jakarta International Conference on Research Innovation and Sustainable Development 2024
https://jicrisd.com
Virtual conference
December 5, 2024

5th MESS

The 5th International Conference on Management, Education, and Social Science
http://messconference.com
Virtual conference
December 10, 2024

IHSATEC 2024: 17th HASIB

The International Halal Science and Technology Conference 2024 (IHSATEC): 17th Halal Science Industry and Business (HASIB)
https://www.ihsatec.com
Hybrid conference (Bangkok, Thailand)
December 19-20, 2024