



SINERGI

p-ISSN: 1410-2331 e-ISSN: 2460-1217
VOL. 27, NO. 3, OCTOBER 2023

Scopus Indexed Journal

Accredited **SINTA 1** by KEMENDIKBUDRISTEK, Decree No: 79/E/KPT/2023



SINERGI

VOL. 27

NO. 3

**PAGES
289-466**

OCTOBER 2023

**p-ISSN: 1410-2331
e-ISSN: 2460-1217**



- Editor in Chief** : Prof. Dr. Andi Adriansyah (UMB, Indonesia)
- Editorial Board** :
- Prof. Dr. Chenwei Deng (Beijing Institute of Technology, China)
 - Prof. Dr. Makbul Anwari (King Abdul Aziz Univ., Saudi Arabia)
 - Prof. Dr.-Ing Mudrik Alaydrus (UMB, Indonesia)
 - Prof. Dr. Muji Setiyo (UNIMMA, Indonesia)
 - Prof. Dr. Nangkula Utaberta (UCSI University, Malaysia)
 - Assoc. Prof. Dr. Ahmad Fithriady (UMT, Malaysia)
 - Assoc. Prof. Dr. Ahmed Turan Ozdemir (Erviyes Univ., Turkey)
 - Assoc. Prof. Dr. Hasliza A. Rahim (UniMAP, Malaysia)
 - Assoc. Prof. Dr. Mahadzir Ishak (UMP, Malaysia)
 - Assoc. Prof. Dr. Rini Akmeliawati (Univ. of Adelaide, Australia)
 - Dr. Acep Hidayat (UMB, Indonesia)
 - Dr. Agab Bakheet Mohammednour (Al-Neelain University, Sudan)
 - Dr. -Ing. Darwin Sebayang (UMB, Indonesia)
 - Dr. Denny Setiawan (Kementrian Kominfo RI, Indonesia)
 - Dr. -Ing. Galih Bangga (Univ. of Stuttgart, Germany)
 - Dr. Ghaida Muttashar Abdulsahib (Univ. of Technology, Iraq)
 - Dr. Hatsari Mitsudharmadi (Abu Dhaby Polytechnic, UAE)
 - Dr. Jae Hyun Yun (Sungkyunkwan Univ., Republic of Korea)
 - Dr. Muchamad Oktaviandri (Universitas Bung Hatta, Indonesia)
 - Dr. Osamah Ibrahim Khalaf (An-Nahrain University, Iraq)
 - Dr. Rosyida Permatasari (Universitas Trisakti, Indonesia)
 - Dr. Setiyo Budiyanto (UMB, Indonesia)
 - Dr. Sunday Ayoola Oke (University of Lagos, Nigeria)
 - Dr. Teguh Prakoso (Universitas Dipenogoro, Indonesia)
 - Dr. Zulfa Fitri Ikatrinasari (UMB, Indonesia)
- Editorial Staff** :
- Yananto Mihadi Putra
 - Mega Avianti
- Editorial Address** :
- Fakultas Teknik Universitas Mercu Buana
Jl. Raya Meruya Selatan, Kembangan, Jakarta 11650
Tlp/Fax: 021-5871335
<http://www.publikasi.mercubuana.ac.id/index.php/sinergi>
-

SINERGI is a peer-reviewed journal published three times a year in February, June and October. The journal is published by Faculty of Engineering, Universitas Mercu Buana. Each publication contains articles comprising high quality theoretical and empirical original research papers, review papers, and literature reviews that are closely related to the fields of Engineering (Mechanical, Electrical, Industrial, Civil and Architecture). The theme of paper is focused on new industrial applications and energy development that synergized with local, green and sustainable technologies.



Reviewers

- Prof. Dr. Eng. Ahmed Khadim Hussein (University of Babylon, Iraq)
Prof. Dana Santoso, PhD (BRI Institute, Indonesia)
Prof. Dr. -Ing. Mudrik Alaydrus (Universitas Mercu Buana, Indonesia)
Prof. Dr. Awaluddin M. Shahrourun (Universitas Islam Madinah, Saudi Arabia)
Prof. Dr. Muhammad Khairuddin (Universitas Negeri Yogyakarta, Indonesia)
Prof. Dr. Zaharuddin Mohamed (Universiti Teknologi Malaysia, Malaysia)
Assoc. Prof. Dr. Azriyenni Azhari Zakri (Universitas Riau, Perancis)
Assoc. Prof. Dr. Setyawan Widyarto (Universitas Selangor Malaysia, Malaysia)
Assoc. Prof. Dr. Wahyu Mulyo Utomo (UTHM, Malaysia)
Dr. Abdusy Syarif (Universitas of Haute Alsace, Perancis)
Dr. Ade Asmi (Universitas Bakrie, Indonesia)
Dr. Agung Purniawan (Institut Teknologi Sepuluh November, Indonesia)
Dr. Amirullah (Universitas Bhayangkara Surabaya, Indonesia)
Dr. Anton Yudhana (Universitas Ahmad Dahlan, Indonesia)
Dr. Arien Heryansyah (Institut Pertanian Bogor, Indonesia)
Dr. Arif Irwansyah (Electronic Engineering Polytechnic of Surabaya, Indonesia)
Dr. Abdullah Dahlan (Universitas Malikussaleh, Indonesia)
Dr. Devi Fitriana (Universitas Mercu Buana, Indonesia)
Dr. Dini Rosmalina (Universitas Pancasila, Indonesia)
Dr. Dwi Agustina Kurniawati (Universitas Islam Negeri Sunan Kalijaga, Indonesia)
Dr. E. Erwin (Universitas Sriwijaya, Indonesia)
Dr. Herry Agung Prabowo (Universitas Mercu Buana, Indonesia)
Dr. I Made Wiwit Kastawan (State Polytechnic of Bandung, Indonesia)
Dr. Iswadi Hasyim Rosma (Universitas Riau, Indonesia)
Dr. Kontan Tarigan (Universitas Mercu Buana, Indonesia)
Dr. Muhammad Abdillah (Universitas Pertamina, Indonesia)
Dr. Muhammad Ikhsan Setiawan (Universitas Narotama, Indonesia)
Dr. Muhammad Syarif Hidayat (Universitas Mercu Buana, Indonesia)
Dr. Munawar Agus Riyadi (Universitas Diponegoro, Indonesia)
Dr. Nunung Widyaningsih (Universitas Mercu Buana, Indonesia)
Dr. Rini Nur Hasanah (Universitas Brawijaya, Indonesia)
Dr. Eng. Rudi Kurnianto (Universitas Tanjungpura, Indonesia)
Dr. Satria Mandala (Telkom University, Indonesia)
Dr. Sally Cahyati (Universita Trisakti, Indonesia)
Dr. Syahril Ardi (Politeknik Manufaktur Astra, Indonesia)
Dr. Yusnita Rahayu (Universitas Riau, Indonesia)
Dr. Yudhi Gunardi (Universitas Mercu Buana, Indonesia)
Dr. W. Waluyo (Institut Teknologi Nasional, Indonesia)

SINERGI is a peer-reviewed journal published three times a year in February, June and October. The journal is published by Faculty of Engineering, Universitas Mercu Buana. Each publication contains articles comprising high quality theoretical and empirical original research papers, review papers, and literature reviews that are closely related to the fields of Engineering (Mechanical, Electrical, Industrial, Civil and Architecture). The theme of paper is focused on new industrial applications and energy development that synergized with local, green and sustainable technologies.



TABLE OF CONTENTS

<p>A review towards Friction Stir Welding technique: working principle and process parameters</p> <p>Rikko Putra Youlia, Diah Utami, Dedik Romahadi, Yang Xiawei Department of Materials Processing Engineering, School of Materials Science and Engineering, Northwestern Polytechnical University, China Department of Industrial Engineering, Faculty of Engineering, Universitas Mercu Buana, Indonesia Department of Mechanical Engineering, Faculty of Engineering, Universitas Mercu Buana, Indonesia</p>	289-308
<p>Optimization of Ultra-Wideband bandwidth for the design of microstrip monopole antennas using Defected Ground Structure and star-shaped patche</p> <p>M. Darsono, Muhammad Rega Department of Electrical Engineering, Faculty of Engineering, Universitas Dharma Persada, Indonesia</p>	309-318
<p>Performance analysis of a single-cylinder type steam turbine with a capacity of 3.5 mw using enthalpy drop method</p> <p>Bagus Adi Saputra, Nurato Department of Mechanical Engineering, Faculty of Engineering, Universitas Mercu Buana, Indonesia</p>	319-326
<p>Mini air conditioning design with two levels of thermoelectric cooler module: cooling heat pipe</p> <p>Irwin Bizzy, Darmawi, Agung Mataram, Fadhil Fuad Rachman Department of Mechanical Engineering, Faculty of Engineering, Universitas Sriwijaya, Indonesia Department of Industrial Engineering, Faculty of Engineering, Universitas Muhammadiyah Palembang, Indonesia</p>	327-332
<p>Project managers competency on project performance of green toll road development project in Indonesia</p> <p>Mairizal, Rahmat Alifiardi, Gilang Ardi Pratama, Mohd Zaimi Abd Majid, Shek Poi Ngian School of Civil Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, Malaysia Department of Industrial Engineering, Faculty of Engineering, Universitas Pamulang, Indonesia Department of Civil Engineering, Faculty of Civil Engineering and Design, Universitas Bung Hatta, Indonesia Department of Civil Engineering & Environment, Faculty of Engineering, Universitas Indonesia, Indonesia</p>	333-342
<p>Image Segmentation in Aerial Imagery: A Review</p> <p>Ade Purwanto, Dewi Habsari Budiarti, Mukti Wibowo, Irfansyah Yudi Tanasa, Yomi Guno, Aris Surya Yunata, Asyraf Hidayat, Fithri Nur Purnamastuti, Dede Dirgahayu National Research and Innovation Agency (BRIN), Indonesia</p>	343-360
<p>The model selection of propeller turbine construction using Analytical Hierarchy Process (AHP)</p> <p>Dedi Wardianto, Mafrizal, Sufiyanto, Rudi Kurniawan Arief, Herry Agung Prabowo, Irfan Hilmy Department of Mechanical Engineering, Faculty of Engineering, Institut Teknologi Padang, Indonesia</p>	361-370

- Department of Mechanical Engineering, Faculty of Engineering, Sekolah Tinggi Teknologi Nasional, Indonesia
 Department of Mechanical Engineering, Faculty of Engineering, Universitas Muhammadiyah Sumatera Barat, Indonesia
 Department of Magister of Industrial Engineering, Faculty of Engineering, Universitas Mercu Buana, Indonesia
 Department of Mechanical Engineering, Faculty of Engineering Technology and Science, Higher College of Technology, UAE
- Study of design criteria for the Ayung River estuary area as an urban riverfront park in Denpasar City, Bali** 371-382
 I Made Agus Dharmadiatmika, Kadek Edi Saputra, Naniek Kohdrata, Hinako Yamagami
 Study Program Landscape Architecture, Agriculture Faculty, Udayana University, Indonesia.
 Global Science Studies, Yamaguchi University, Japan
- Proposed model and strategy for Indonesian higher education facing technological disruption and Industrial Revolution 4.0 using Newton's Laws analogy** 383-392
 Erkata Yandri, Sparisoma Viridi, Rizal F. Hariadi
 Graduate School of Renewable Energy, Darma Persada University, Indonesia
 Department of Physics, Faculty of Mathematics and Natural Sciences, Institut Teknologi Bandung, Indonesia
 Department of Physics, Arizona State University, US
- The impacts of 5D-Building Information Modeling on construction's Time and cost performance** 393-404
 Hedy Herdyana, Agus Suroso
 Department of Civil Engineering, Faculty of Engineering, Universitas Mercu Buana, Indonesia
- Application of Capacity Spectrum Method (CSM) for non-symmetrical reinforced concrete high-rise buildings as a tool for seismic design** 405-414
 Ayuddin, K. R. Bindhu
 Department of Civil Engineering, Faculty of Engineering, Universitas Negeri Makassar, Indonesia
 Department of Civil Engineering, Faculty of Engineering, College of Engineering Trivandrum, India
- Fabrication of mercury (Hg) sensor based on Tire Waste (TW) carbon electrode and voltammetry technique** 415-422
 Baihaqi, Khairi Suhud, Sagir Alva, Eka Safitri, Julinawati, Binawati Ginting, Syafrizal Fonna, Ahmad Kamal Arifin, Zulnazri Zulnazri, Nurul Islami
 Department of Chemistry, Mathematics and Natural Science Faculty, Universitas Syiah Kuala, Indonesia
 Department of Mechanical Engineering, Faculty of Engineering, Universitas Mercu Buana, Indonesia
 Mechanical Engineering and Industrial Engineering Department, Engineering Faculty, Universitas Syiah Kuala, Indonesia
 Centre of Integrated Design for advanced Mechanical System (PRISMA), Universiti Kebangsaan Malaysia, Malaysia
 Chemical Engineering Department Universitas Malikussaleh, Indonesia
 Material Engineering Department Universitas Malikussaleh, Indonesia
- Using Particle Swarm Optimization for Power System Stabilizer and energy storage in the SMIB system under load shedding conditions** 423-432
 Mansur Mansur, Muhammad Ruswandi Djalal
 Department of Electrical Engineering, Halu Oleo University, Indonesia
 Department of Mechanical Engineering, State Polytechnic of Ujung Pandang, Indonesia
- Modeling and implementing a load management system for a solar home system based on Fuzzy Logic** 433-442
 Makmur Saini, Muhammad Ruswandi Djalal, Muhammad Azhar, Golda Evangelista Patrix
 Energy Powerplant Study Program, Department of Mechanical Engineering, Politeknik Negeri Ujung Pandang, Indonesia

- Good Manufacturing Practice (GMP) in Tofu MSMEs in North Aceh** 443-450
Cut Ita Erliana, Iskandar Hasanuddin, Yuwaldi Away, Raja Ariffin Raja Ghazilla5
Doctoral Program, School of Engineering, Universitas Syiah Kuala, Indonesia
Department of Industrial Engineering, Universitas Malikussaleh, Indonesia
Department of Mechanical and Industrial Engineering, Universitas Syiah Kuala,
Indonesia
Department of Electrical and Computer Engineering, Universitas Syiah Kuala,
Indonesia
Department of Mechanical Engineering, Faculty of Engineering, Universiti Malaya,
Malaysia
- Optimized Swarm Enabled Deep Learning Technique for Bone Tumor Detection
using Histopathological Image** 451-466
Dama Anand, Osamah Ibrahim Khalaf, Fahima Hajje, Wing-Keung Wong, Shin
Hung Pan, Gogineni Rajesh Chandra
Department of Department of Computer Science, Koneru Lakshmaiah Education
Foundation, India.
Department of Solar, Al-Nahrain Research Center for Renewable Energy, Al-
Nahrain University, Iraq
Department of Information Systems, College of Computer and Information
Sciences, Princess Nourah bint Abdulrahman
University, Saudi Arabia
Asia University, Taiwan
Department of Department of Computer Science, KKR & KSR Institute of
Technology and Sciences, India