

Table of Contents

Preface, Committees

Chapter 1: Computer Technology, Artificial Intelligence and Information Processing

Privacy Enhanced Federated Learning in Encrypted Anonymous Personal Device Domain M.S. Brennaf, P. Yang and V. Lanfranchi	3
Web-Based Intelligence Surveillance System to Detect Area Intrusion Using RT-DETR with Limited Dataset K.A. Sastramiharja and G. Alfian	13
Development of Container as a Service Management Platform and Architecture Utilizing Linux Container D.M. Asif, A.L.N. Irsyad, S. Alam and Y.Y.K. Budiman	23
Song Longevity on Music Chart Prediction Using Machine Learning Models S. Sumadi, D.F.R. Pardede, C.N. Taufiek, I.S. Edbert and D. Suhartono	31
Critical Challenge Factors of Requirement Change Management for GSD: A Systematic Review M. Azmy, R. Ferdiana and A.R. Pratama	38
Facilitating Cursive Chinese Calligraphy Generation with Quantum Computing Technology H.C. Hsu, Y.S. Chu, Y.J. Hsu and Y.C. Wu	49
A Design of Key Element Selection Rules for Behavior Understanding Problem in Web-Client Programming Learning H. Qi, N. Funabiki, K.H. Wai and F.V. Hendryanna	58
A Proposal of Element Fill-in-Blank Problems for Self-Study of Web-Client Game Programming H. Qi, N. Funabiki, K. Wai and M. Mentari	66

Chapter 2: Mechatronics and Control

Production Monitoring System Using Programmable Logic Controllers and SCADA in the Automotive Manufacturing Industry A.P. Putro, A.D. Nursumiadi, S. Ardi, S. Fairus and A. Afianto	75
Smartphone-Based Food Traceability System Using NoSQL Database M. Syafrudin, G. Alfian and N.L. Fitriyani	83
Development of the Automation System for Mobile Gamma Scan Tomography Device to Measure Scaling in Geothermal Pipelines D.N.A. Grahita, A. Abimanyu, I. Istanto and B. Azmi	93
Development of Wide-Angle Fisheye Vision System for Smart Home Security: An Initial Study H. Wijanarko, M.R. Simanungkalit, T.M.A. Siahaan, M.S. Gozali, D. Oktani, A.D. Futra and K. Kamarudin	104
Development of a PLC-Based Kartini Reactor Operation Data Acquisition System M.S. Akbar, Z.E. Bhagaskara and S. Sutanto	111
Speed Improvement of Maximum Power Point Tracker (MPPT) Based on Perturb and Observe (P&O) Algorithm by Using Fractional Short Circuit Current (FSCC) on the FPGA M.S. Anwar, J. Hendry and Y.P. Yudhanto	122
Three Degree-of-Freedom (3 DoF) Object Tracking Manipulator Robot Equipped with Infrared Sensor Array R.A. Roiyyaan, U.Y. Yusmaniar and P.A. Sejati	134
High-Level Synthesis Pipeline Optimization Method for ANN Backpropagation Algorithm Using FPGA SoC N. Afianah and A.E. Putra	142

Chapter 3: Research and Design of Machines Parts and Equipment

Wind Energy Prospect Assessment by Weibull Distribution on Tasikmalaya as Prospective Area	
R. Istoni, M. Sulaiman, Z. Ibrahim, B. Wicaksono, W.A.A. Praditasari, I. Kholis and D. Sugiyanto	153
Performance and Potential of Solar Power Plants on Canopy Roofs: Evaluation and Implications	
H. Ardian, S.W. Widyanto, W. Wilopo and S. Pramonohadi	162
Solar Hybrid Grain Dryer Machine	
H.K. Safitri, B. Setiawan, W. Widjanarko, M. Rifa'i and R.A. Kurniawan	175
Considering PV Economic Scale in Generation Expansion Planning for RE Integration Acceleration: Centralized PV VS Distributed PV	
A.A. Muthahhari, C.F. Nugraha, N.H. Fauzan, L. Subekti and R.F.S. Budi	185
Application of Multilayer Perceptron for Estimating Relative Humidity in Cilacap, Indonesia	
W. Abdillah and S. Fauziati	192
Characterizing Nonlinear Dynamics of Logistic Map Using Machine Learning: A Coarse Approach	
B.S. Aji, F. Nugroho and M.E. Wibowo	202
Simulation Heatsink Orientation on Thermal Dissipation Performance, Study Case in Active Cooling M.2 NVMe	
F.H. Wibowo, S. Sujito, M.R. Faiz, N.H. Teguh, D.S. Prayogo and B.A. Wicaksono	214
The Vibration Analysis on Various Railway Damages Using Support Vector Machine Method	
S.M.N. Cahya, A. Winarno, R. Krisnaputra, R.I.D. Sandhy, Y.M.N. Zaman and I. Bahiuddin	225
Development of IoT Devices for Drinking Water Quality Monitoring Systems	
N.A. Dharmawan, P. Nugroho and S.B. Wibowo	238

Chapter 4: Engineering Solutions and Deep Learning Techniques in Biomedical Practice and Health Care

High-Resolution Subsurface Photoacoustic Imaging of the Teeth Layer	
A.W. Sari, R. Widyaningrum, A. Setiawan and M. Mitrayana	249
A Review on Health Monitoring System for Industry Workers: Requirement, System, and Performance	
I.N. Hakim, S.S. Utami, T. Lestari and N. Norpiadi	256
Design and Analysis of Non-Invasive Glucometer Using Semi-Cylindrical Capacitive Sensor (SCCS) Based on ATmega328P Microcontroller	
I.P.F. Rachmawan, M.A. Alfariis and A. Baihaky	273
Development of STM8 and Kalman Filter Based Heater Controller for Automatic Tissue Processor	
N.R. Aryaputra, J. Hendry, H.N. Isnianto and A.N.B. Mukti	304
Exploring Digital Solutions in Oncology Nursing Pain Management: A Qualitative Study	
Y.N. Fithriyyah, H. Haryani and A.L. Hanum	318
Online Health Community Recommendation System with LDA-FCM Approach	
S. Shan, U. Farooq, J.L. Wang, Y.L. Li and D.B. Gümüş	329
Web-Based Software Development: Diabetes Mellitus Prediction	
M.C. Saputra, G.A. Pradana, M.A. Azzahra, D. Firmansyah and L. Heryawan	343
Memoria: A Serious Game for Enhancing Short-Term Memory in Residual Schizophrenia	
T.R.N. Maghribi, D.D. Ariananda and A. Nasikun	356
Intelligence Sports Performance Analytics from Strava Using Big Data Platform with Multi-Layer Perceptron	
A.A. Nugroho	364
Smart AI Baby Body Scanner (SABBS): A Mobile Application for Infant Height Measurement	
A.D. Wibowo, L. Heryawan, W. Maaroja, M.I. Wafa and A.W. Priyanto	380

Chapter 5: Communication and Navigation

Near Real Time Ionosphere Opening Channel Information for HF near Vertical Incidence Skywave Communication over Kupang Nusa Tenggara Timur Indonesia A. Purwono, V. Dear, R. Suryana and A.S. Mardiani	393
Multi-Object Trajectory Prediction with Crossing Detection Using Interacting Multiple Model Kalman Filter R.N. Fatimah, B.R. Trilaksono and A. Widyaputra	403
Simulation and Performance Analysis of Manet in Post-Disaster Areas Utilizing Proactive Routing Protocol (Case Study: Palu Earthquake 2018) M. Husni, H.T. Ciptaningtyas and N.A.Q. 'Ain	413
Moving Zone Clustering for Device-to-Device Users Based on Binary Message Passing G.R.R. Dewa	425

Chapter 6: Remote Sensing and Geomatics

Flood Risk Mapping in Katingan Regency Using Composite Mapping Analysis (CMA) Method I.A. Eris, H.F. Assidiq, D. Wahyudi and L. Wahyuningtiyas	437
Study on the Quality of Land Data Utilised in Land Policy Making around the International Borders in Sebatik Island R.D.S. Al Chodiq and I.M.A. Arsana	452
Built-Up Land Change and Spatial Population Distribution in Madiun City V. Imandita, R. Rachmawati and A. Kurniawan	459
Analysis of VTEC and Scintillation Parameters during Very Strong Geomagnetic Storm Events at Pontianak A.Y. Putra, A. Rakhman, P. Abadi, T.M. Irnaka, L.O.M. Musafar Kilowasid and E. Erlansyah	471
Design of Shipping Channels, Berthing Areas and Turning Basin by Utilizing Bathymetry and Side Scan Sonar Data at the Branta Harbor, East Java B.P. Situmorang and B.K. Cahyono	481
Correlation Analysis of Chlorophyll-a and Sea Surface Temperature with Fish Production in Baron Beach Gunungkidul Using Remote Sensing Technology H.A. Ajrin and L.S. Heliani	496
Individual Tree Detection for Qualitative Inventory Eucalyptus Pellita Using Unmanned Aerial System (UAS) R. Sasongko and B.S. Widartono	517
Capabilities of UAV Photo Technology for Detailed Mapping of Pipelines Q.I. Himawan, L. Fitri, N. Widjajanti and H.I. Azizi	532
Mapping Forest Condition Based on Time Series Tasseled Cap Transformation (Case Study: Leuweung Sancang Nature Reserve, West Java, Indonesia) A.A. Fahrezi, M. Marzuki and M. Arrafi	555
Spatial Quality Study of Land Parcels Resulting from Integrated Physical Data Collection in Samarinda City, Indonesia F.B. Permadi, N. Widjajanti, F.A. Singagerda and T. Riswanto	569
The Role of Unmanned Aerial Vehicle for Biosecurity Risk Management B.S. Widartono, F.N. Puspatiyaningrum and A.F.A. Hadi	586
Evaluation of Water Depth Extraction Using Empirical Method with Sentinel 2 Image on Google Earth Engine in South Sea Island of Bangka Belitung B.K. Cahyono and J.B. Sihombing	595
Detached Hexareef Breakwater Configuration Design to Reduce the Effect of Ocean Waves at Eco-Resort Area Raja Ampat A.R. Abdullah, B.K. Cahyono and H.D. Armono	610
Integration of Sentinel-1A and Sentinel-2A on Identifying Mangrove Using Random Forest Algorithm in Youtefa Bay, Papua Indonesia R. Ginting, S. Arjasakusuma and N.M. Farda	628

Multi-Level Remote Sensing Imagery to Study Land Use Changes in the Strategic Area of Yogyakarta International Airport N. Kurnia and I.N. Hidayati	642
Spatial Modeling of Volcano Merapi Lahar Flow Post 2010 Eruption in Krasak River for Hazard Zone Prediction A.K. Putra and S.B. Wibowo	652
Remote Sensing and Geographic Information System for Determining the Location of 3R Waste Processing Sites in Singosaren Village N. Rafifah and S.B. Wibowo	662
Towards Sustainable Urban Development: Analysing the Relationship between UHI and Population Density in Batam L.R. Sari, D.T. Junaika and L.A. Wijayanti	672
Object-Based Image Analysis for LULC Change Detection: Impact of Yogyakarta International Airport Development Y. Oktaviana and A. Basith	685
Utilization of Open-Source Photogrammetry Software with Structure from Motion Algorithm for Three- Dimensional Modeling B.É. Laia, M.U. Nuha, D. Setiaji, E.L. Isnaini, R.S. Perdana and A.T. Atmojo	698

Chapter 7: Machine Learning Procedures in Engineering Management

Clustering Tax Compliance Data Using <i>k</i>-Means Algorithm: A Study Case of Manufacturing Companies in Indonesia N. Uddin, A. Dwianika, I.P. Sofia and Y.T. Suyoto	711
Future Trends Business Process Model Automation – Systematic Literature Review A.S.S. Negara, R. Ferdiana and P.I. Santosa	719
A Deeper Analysis of Using Single and Integrated Use of Enterprise Architecture Modeling Languages A.E.A. Sanyoto	729
Enhancing Warehouse Efficiency and Competitiveness in Logistic through Digital Twin and Simulation Integration S. Tijani, U. Farooq and G. Alfian	739
Cross-Regional Digital Marketing Strategies: A Competitor Analysis of the Flooring Industry in the United Kingdom and Southeast Asia C.W. Huey, C. Daowd and U. Farooq	752
Performance Low-Cost Spectrometer for Classification of Tempeh Maturity Quality T.S. Syahputra, J. Widada, W. Wahyono and K. Triyana	765
Comparative Study of Pre-Trained CNN for Pinkeye Disease Detection in Cattle and Goat Eyes R. Faurina, M.F. Al Rahman and I. Agustian	771

Chapter 8: Smart Society

Smart City Implementation in Boyolali Regency M.I. Putri and R. Rachmawati	783
Utilization of Bantulpedia Application to Support Smart Governance in Bantul Regency B. Oktavian and R. Rachmawati	796
The Road Condition Classification Using Machine Learning Method Based on Vibration Measurement Data in Yogyakarta M.T. Hermawan, A. Winarno, A.A. Ismail and I. Bahiuddin	802
SmartSpectorAI: Roadside Parking Warning System for Congestion Prevention in Yogyakarta City R.B.M.A.P.A. Wijaya, D.N.A. Putri, N. Nailfaaz and D.R. Fudholi	814
A Survey of Sentiment Analysis in Halal Tourism Using Machine Learning and Lexicon Approaches for Extracting Sentiment Polarity B. Jan, A. Hamid, M.F. Muna and H. Aljamaan	825

Knowledge Management Analytic Dashboard for Supporting COVID-19 Mitigation in Indonesia

M. Riasetiawan and A. Ashari

845

Graph Coloring Application with Modified Tabu Search Algorithm in School Scheduling

O. Listiyaningrum and D. Darmaji

854