

2025 19th International Conference on Telecommunication Systems, Services, and Applications (TSSA 2025)

**Yogyakarta, Indonesia
30-31 October 2025**

IEEE Catalog Number: CFP2591P-POD
ISBN: 979-8-3315-5948-9



Copyright © 2025, IEEE

All Rights Reserved

Copyright and Reprint Permissions:

Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP2591P-POD
ISBN (Print-On-Demand):	979-8-3315-5948-9
ISBN (Online):	979-8-3315-5947-2
ISSN:	2372-7314

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA

Phone:	(845) 758-0400
Fax:	(845) 758-2633
E-mail:	curran@proceedings.com
Web:	www.proceedings.com

TABLE OF CONTENTS

Hybrid Metaheuristic Approaches for Vehicle Routing Optimization in Distribution Networks: GWO, SOS, ACO and Their Combinations	1
<i>Maxsi Ary, Titik Khawa Abdul Rahman, Rangga Sanjaya, Budi Fitriadi, Erika Nurmartiani, Hetti Herawati</i>	
IoT for Monitoring Ground Movement Integrated with Data Logger	7
<i>Intan Komalasari, Ivany Sarief</i>	
Control, And Monitoring System Design Cultivation of Lettude Using Method Aeroponics Based on Smart Farming	12
<i>Mohamad Agus Fhaizal, Muhammad Rizki, Wisnu Wijaya, Winardi Sani, Jejen Jaelani Frihatna Cecep Deni Mulyadi</i>	
Cluster Validity Evaluation of Fuzzy Relational Clustering for Air Temperature Data	16
<i>Novi Mardiana, Agus Yodi Gunawan, Muhammad Indrawan Tanjung, Fiki Setiawan, Nurwathi Nurwathi Ade Geovania Azwar</i>	
Improved Plankton Species Classification Accuracy Using the Ensemble Learning Method	22
<i>Teguh Nurhadi Suharsono, Muhammad Fadli Fauzi Sileuw, Riyo Wardoyo, Gunawan Gunawan Rini Nuraini Sukmana, Shula Khalid Mauliawan</i>	
Sentiment Analysis of User Comments on the Twitch Platform Using the Long Short Term Memory (LSTM) Method	29
<i>Andhika Fathur Rahman, Teguh Nurhadi Suharsono, Gunawansyah, Tia Sugiri, Bambang Sugiarto Heri Sisworo</i>	
Integration of Aiken Content Validation with Fuzzy AHP to Model the Quality of Software in MOOC Environments	35
<i>Mugi Praseptiawan, Ahmad Naim Che Pee, Moh Hafiz Zakaria, Lina Nurhayati, Welly Surjono Lucy Nurfadilah</i>	
A Heuristic Approach for Solving Ring Topology Network	42
<i>Jupriyadi, Hasan Nur Arifin, Eki Ahmad Zaki Hamidi, Nana Rachmana Syambas</i>	
Optimizing LSTM Based Speech Emotion Recognition Using MFCC Features for Multiclass Emotion Classification	47
<i>Odi Nurdiawan, Nana Suarna, Robertus Suradji, Hersusetiyati, Adi Permana, Rima Wijayanty</i>	
Object Detection on Analog Water Meters Using Region-Based CNN	56
<i>Leni Fitriani, Muhamad Fitroh Sodikin, Rita Rismala, Abdul Chalid, Chandra Afriade Siregar, Rita Avianty</i>	
Implementation And Evaluation Of Random Forest, XGBoost Algorithms And Trust Management Based On Simple Blockchain For DDoS Attack Detection In Vanet Using Simulation-Based Data	62
<i>Mahardika Wisnu Aji, Hendrawan, Nana Rachmana Syambas, Galih Nugraha Nurkahfi</i>	
Comparative Benchmarking of Floating PV Governance: A Five-Pillar Evaluation of Cirata, Hapcheon, and O'MEGA1	67
<i>Jack Febrian Rusdi, Vicente Pitogo, Danny Aidil Rismayadi, Didin Kusdian, Heri Sismoro, Nurhaeni Sikki</i>	
The Impact of Collusive Interest Flooding Attack (CIFA) on Forwarding Strategy in Named Data Networking (NDN)	72
<i>Daffa Farros Alfarobby, Aulia Royyan, Ratna Mayasari, Jupriyadi, Nana Rachmana Syambas</i>	

Flood Disaster Sentiment on Social Media Using IndoBERT and Support Vector Machine	78
<i>Ade Sutedi, Novan Rodiansyah, Rinda Cahyana, Lenny Kristianti, Reza Sacful Rahman, Slamet Risnanto</i>	
DDoS Detection in VANETs Using a Multilayer Perceptron and Simple Blockchain-Based Trust Management for False Positive Minimization	84
<i>Ibrahim Abdullah Azzam, Galih Nugraha Nurkahfi, Hendrawan, Nana Rachmana Syambas</i>	
Design and Implementation of a CDN Testbed for Performance Evaluation of NGINX-Based Content Distribution	91
<i>Akbar Febry Wahyu Andrian, Hanif Al Falih, Mohammad Ridwan Effendi, Ian Josef Matheus Edward</i>	
IoT-Based Smart Monitoring of Energy Consumption in Wastewater Treatment Pump Panels	96
<i>Praiska Arya Anugrah, Hartuti Mistialustina, Ivany Sarief, Hardy Purnama Nurba, Mohamad Agus Fhaizal Deden Rizal Riadi</i>	
Enhancing Smart Anthropometry for Stunting Detection Through Wireless Modular Communication in a Cyber-Physical System	102
<i>Daniel Nugraha, Muhammad Fahmi Nurfadilah, Kosasih, Dadang Saeful, Fitriana Ary Setijadi Prihatmanto</i>	
Hybrid Visual Feature Extraction for Goldfish Image Classification Using K-Nearest Neighbor	108
<i>Fitri Marisa, M. Ilham Setyo Wahyudi, Anastasia Lidya Maukar, Adriadi, Farida Yuliaty, Rina Novianty</i>	
Automatic Classification of Motorcycle Exhaust Noise with MFCC and CNN for Urban Noise Monitoring	114
<i>Khaerul Manaf, Luthfi Raynalfi Firdaus, Aldy Rialdy Atmadja, Raden Muhammad Adrian Aedah Binti Abd Rahman, Kusmadi</i>	
Improve the Openness of Disaster Relief Funding through the Use of Consortium Blockchain	120
<i>Inayatulloh</i>	
Implementation of Decision Tree Algorithm for Classifying the Ability to Read the Qur'an Using the Tahqiq Method with Python	125
<i>Yanyan Gunawan, Acep Sopian Firmansyah, Beki Subaeki, Kaerul Manaf, Heri Purwanto Hanhan Hanafiah Solihin</i>	
Blockchain Consortium Model to Improve Water Supply Chain Transparency to Support Smart Cities	131
<i>Inayatulloh</i>	
U-Net-Based Segmentation of Disease-Affected Areas in Rice Fields Using Aerial Imagery	136
<i>Dwi Ratna Sulistyaningrum, Gloria Laura, Budi Setiyono, Mahmud Yunus</i>	
Enhancing Telemetry Link Reliability and Range in NLOS Environments Through Data Compression	142
<i>Daru Kristian Aji, Aldo Agusdian, Hamonangan Situmorang</i>	
A Fire Extinguishing Robot For High-Risk Areas with Camera-Assisted Fire Detection	146
<i>Achmad Fauzi, Hardy Purnama Nurba, Ketut Abimanyu, Ivany Sarief, Kusmadi, Nina Lestari</i>	
Integrating DeepSeek API in Designing Krisna.ai as Artificial Intelligence Chat Assistant	152
<i>Edi Supriyadi, Ahsani Takwim, Dedi Rosadi, Raden M Adrian, Hanny Rahayu, Bambang Susanto</i>	
Accident Detection with Capsule Network by Quantum Trace Distance-based Routing	158
<i>Ridho Nur Rohman Wijaya, Budi Setiyono, Dwi Ratna Sulistyaningrum</i>	

Effect of Training Epochs on Multi-Label Emotion Classification Using RoBERTa with Focal Loss	164
<i>Yoppy Sazaki, Ahmad Fadhil Yusof, Ab Razak Che Hussin, Chan Weng Howe</i>	
Analysis of The Effect of Distance-Based Clustering on Ensemble Model Performance for Cellular Signal Prediction in Urban Areas	168
<i>Fikry Adam, Iskandar, Hajiar Yuliana</i>	
Advanced Residual Networks Model for Detecting Cyberattacks in Internet of Things Forensic Investigations	172
<i>Randi Rizal, Siti Rahayu Selamat, Mohd Zaki Mas'Ud, Suharjanta Wisnu Pitara, Hetti Herawati Ahmad Munandar</i>	
Analysis of The Effect of Distance-Based Clustering on Ensemble Model Performance for Cellular Signal Prediction in Urban Areas	178
<i>Fikry Adam, Iskandar, Hajiar Yuliana</i>	
Time Domain Repetition Code (TDRC) Implementation on Inter-High Altitude Platform Station (HAPS) Free Space Optics (FSO) Links in Atmospheric Channel	182
<i>Herlani Ayu Rahmawati, Effrina Yanti Hamid, Iskandar Iskandar</i>	
Evaluating Real Deployment NDN Router Performance under the Interest Flooding Attack (IFA)	190
<i>Jupriyadi, Eueung Mulyana, Nana Rachmana Syambas</i>	
Performance Analysis of Multicast VANET Strategies in NDN-Based Vehicular Networks Using 3x2 Grid Topology	195
<i>Syaiful Ahdan, Juan Kevin Aritonang, Syauqi Armand, Anisa Mahadewi, Eki Ahmad Zaki Hamidiec Iskandar, Nana Rachmana Syambas</i>	
BER Analysis of SIMO-based Spatial Diversity Reception Technique (SDRT) FSO System for Inter-HAPS Link	201
<i>Diestyan Hikmal Ghifari, Effrina Yanti Hamid, Iskandar Iskandar</i>	
Development Of A Web-Based Employee Attendance Application With Gamification And GPS Technology To Improve Attendance Discipline	207
<i>Khalisha Fitriyani, Heri Purwanto, Edi Andiansyah, Khaerul Manaf, Hanhan Hanafiah Solihin Djoko Pitoyo</i>	
An Empirical Evaluation of Information Literacy and System Quality in Detik.com Based on the DeLone and McLean Model	212
<i>Beki Subaeki, Khaerul Manaf, Yanyan Gunawan, Widyapuri Prasastiningtyas, Resad Setyadi, Hersusetiyati</i>	
A Web-Based Machine Learning Application for Employee Attrition Prediction	220
<i>Ibni Inggrianti, Eueung Mulyana</i>	
Development of Intelligent PCAP Analyzer Application Using Ensemble Machine Learning for IoT Network Attack Detection	225
<i>Nur Widiyasono, Husni Mubarak, Mochamad Rifqi Atthoriq, Hanhan Solihin, Didin Saepudin Eva Rachmawati</i>	
Accuracy–Latency Trade-offs and Computational Complexity of Ultralytics YOLOv11 for Real-Time Video Object Detection	231
<i>Kholidiyah Masykuroh, Hendrawan Hendrawan, Eueung Mulyana</i>	

Building a Smarter Parking System Based on the IoT and RFID using the Rational Unified Process Method	237
<i>Dini Destiani Siti Fatimah, Leni Fitriani, Hilmi Pauzi, Andini Radisya Pratiwi, Muhammad Syukri, Kusmadi</i>	
A Deeper Look into Stable Diffusion in Generating Building Images	242
<i>Dewi Tresnawati, Vitradisa Pratama, Fitri Nuraeni, Dody Kusmana, Tanto Trisno Mulyono, Nina Lestari</i>	
Ring Interconnection Methods and Algorithms: Case study on Sumatra Island Topology in NDN Network	247
<i>Syaiful Ahdan, Dzata Farahiyah, Ade Nurhayati, Adi Sucipto, Nana Rachmana Syambas</i>	
Machine Learning Approach for Integrated Sensing and Communication in 6G Radio Standard: A Systematic Literature Review	254
<i>Daniel Wiyogo Dwiputro, Hendrawan</i>	
Analysis and Redesign Using the User-Centered Design Method and Usability Scale to Optimize the Use of the Whoosh Application	260
<i>Heri Purwanto, Rudy Sofian, Fahmi Reza Ferdiansyah, Mochamad Alif Fauzan, Khaerul Manaf Edi Andriansyah</i>	
Digital Business Value in Disaster Resilience: Case Study of ASEAN's Integrated Early Warning System for Earthquake-Prone Regions	265
<i>Yudi Limbar Yasik, Jack Febrian Rusdi, Marsudi Wahyu Kisworo, Teguh Aprianto, Iwan Abadi Renny Sunarny</i>	
Pneumatic Conveyor System Design for Polyester Chips Transfer Process Using OMRON CP1E-N30DR PLC	270
<i>Ajeng Mayang K. S., Decy Nataliana, Gilang Permana Wihendar, Mohamad Agus Fhaizal Cecep Deni Mulyadi, Ketut Abimanyu Munastha</i>	
Classification of Cellular Network Anomalies from KPI Data Using Machine Learning: A Study Without Synthetic Data Generation	276
<i>Hajiar Yuliana, Iskandar, Hendrawan</i>	
Validation of mMTC Traffic Simulation Using Real Network Connection Logs	283
<i>Innel Lindra, Hendrawan, Eueung Mulyana, Agus Subekti</i>	
Assessing Empathetic Engagement in AI-Generated Clinical Dialogues: A Computational-Psychological Hybrid Approach	290
<i>Yoenie Indrasary, Ary Setijadi Prihatmanto, Metty Verasari, Slamet Risnanto, Wenti Frisca Dhema Yunautama</i>	
ESP32-Driven Smart Lighting Management for Airport Facilities	295
<i>Dwiki Aditya Wibowo, Hartuti Mistialustina, Nina Lestari, Rudy Gunawan, Erna Garnia, Nenny Hendajany</i>	
Decision Support System in Attendance and Payroll as a Part of IT Governance	300
<i>Vitradisa Pratama, Irsam Satya Gana, Fakhry Dinan Idris, Inayati Nasrudin, Audita Setiawan Sukadwilinda</i>	
Enhancing Communication Efficiency in UAVs for Search and Rescue Missions Through Telemetry Data Compression	305
<i>Muhammad Rivan Prawira Gustha, Aldo Agusdian, Hamonangan Situmorang</i>	

Proposed ICT-Enabled Multidimensional Framework for Floating Solar PV: A Case Study in Cirata, Indonesia	311
<i>Jack Febrian Rusdi, Marsudi Wahyu Kisworo, Sazilah Salam, Suharjanta Wisnu Pitara, Dea Yunita Sari Jejen Jaelani Frihatna</i>	
The Use Of Augmented Reality In The Digital Transformation Of Early Childhood Education	316
<i>Abdul Alpariji, Heri Purwanto, Beki Subaeki, Suharjanta Wisnu Pitara Raden Muhammad Adrian Septiandry, Peti Savitri</i>	
Rateless Transmission Based on Short Polar Codes for Free Space Optical Links	322
<i>Yuyun Siti Rohmah, Iskandar, Khoirul Anwar, Mohammad Sigit Arifianto</i>	
Collision-Aware Multi-User Channel Selection via Penalty-Tuned Thompson Sampling	328
<i>Dzata Farahiyah, Iskandar, Hendrawan, Khoirul Anwar</i>	
Integrated Image Enhancement Pipeline Using Wavelet Transform, CLAHE, and Low-Pass Filtering for Chest X-Ray Classification with EfficientNet-V2	334
<i>Sri Rahayu, Ayu Aliyah Asidqi, Yosep Bustomi, Raden Ricky Agusady, Hanhan Hanafiah Solihin Dhema Yunautama</i>	
Impact of Stability-Based Client Selection on Overhead Traffic in Federated Learning Systems	340
<i>Kukuh Nugroho, Hendrawan, Iskandar</i>	
Automatic Static Voltage Sensing during Circuit Assembly for Electrical Engineering Laboratory Activity	345
<i>Moh Tri Wahyu R, Ardi Hidayat, Achmad Defanni Almizar, Hardy Purnama Nurba Ketut Abimanyu Munastha, Nina Lestari</i>	
Subsurface Utility Mapping Using Ground Penetrating Radar in Bogor Strategic Area	350
<i>Dody Kusmana, Dea Yunita Sari, Muhammad Syukri, Doni Romdhoni Witarsa, Hendra Garnida, Rosadi</i>	
Exploration of Machine Learning Prediction Models for VM Performance Monitoring in Cloud Infrastructure	354
<i>Rahadian Adiguna Wicaksono, Aditya Arya Putranda, Hamonangan Situmorang, Galih Nugraha Nurkahfi</i>	
Machine Learning Driven Fault Detection in Optical Networks: A Comparative Evaluation for Data Imbalance Mitigation	360
<i>Rohmat Tulloh, Nana Rachmana Syambas, Eueung Mulyana, Adam Mulyono, Ridha Muldina Negara</i>	
Two-Layer FFR with Dynamic R_{th} : Impact of User Composition	365
<i>Muhammad Yaser, Iskandar Iskandar, Mohammad Sigit Arifianto, Khoirul Anwar</i>	
Learning-Based Cache Replacement Implementation in Content Delivery Network Testbed Using Machine Learning	370
<i>Hanif Al Falih, Akbar Febry Wahyu Andrian, Mohammad Ridwan Effendi, Ian Josef Matheus Edward</i>	
Physiological Symptom-Based Classification of Potato Leaf Diseases Using K-Nearest Neighbor	375
<i>Fitri Marisa, Muhammad Auzhar Rafli Ramadhani, Anastasia Lidya Maukar, Peti Savitri, Saepudin Anita Syafariah</i>	
Performance Evaluation of Nano Grid Application Using Single-Phase Inverter With SPWM Based MOSFET Driver	381
<i>Hardy Purnama Nurba, Febrina Nugraha, Ivany Sarief, Ketut Abimanyu Munastha, Vip Paramartha Adi Permana</i>	

A Machine Learning Approach for VANET Service Quality Prediction: Random Forest, SVM, and ANN	387
<i>Eki Ahmad Zaki Hamidi, Nana Rachmana Syambas, Hendrawan, Muhammad Ali Ramdhani</i>	
Enhancing Categorical Data Classification for Lung Disease Prediction Using Information-Theory Based Encoding and XGBoost	392
<i>Fitri Nuraeni, Dewi Tresnawati, Yoga Handoko Agustin, Raden Ricky Agusiady, Rudy Gunawan Hartuti Mistialustina</i>	
A Review of Context-Aware Anomaly-Based Detection of Ransomware in Modern Information Systems	397
<i>Ana Heryana, Agus Hariyanto, Rudy Gunawan, Sukadwilinda, Ivany Sarief, Kusmadi</i>	
Stunting Risk Classification in Toddlers Based on Nutritional Data Using Random Forest Classifier	403
<i>Fauzan Andriana Rachman, Teguh Nurhadi Suharsono, Riffa Haviani Laluma, Yanti Irawati Lenny Kristianti, Bambang Sugiarto</i>	
Block Ballot: Universal Verifiability in e-Voting System	408
<i>Teguh Nurhadi Suharsono, Renandh Alifian Putra Teguh, Gunawan Gunawan, Slamet Risnanto Sofiani Nalwin Nurbani, Rosadi Rosadi</i>	
Design And Implementation of A Bluetooth Low Energy (Ble) Anti-Theft System For Motorcycles Using Esp32	415
<i>Jejen Jaelani Frihatna, Raka Nursalam, Yanuandri Putrasari, Mohamad Agus Fhaizal, Kusmadi Kusmadi Hanny Rahayu</i>	
A Layered Framework for Security and Interoperability E-Government Infrastructures in Emerging Economies	421
<i>Slamet Risnanto, Gunawan, Riffa Haviani Laluma, Teguh Nurhadi Suharsono, Raden Ricky Agusiady Bambang Susanto</i>	
Decision Support Model for Employee Performance Evaluation Using Fuzzy and Weighted Product Methods	427
<i>Muhammad Fauzan Noor Azhar, Riffa Haviani Laluma, Bambang Sugiarto, Teguh Wiharko, Didin Kusdian Dwi Haryono Aji Wibowo</i>	
The Implementation of the Analytic Hierarchy Process (AHP) for a Tourism Recommendation System in Greater Bandung Area	433
<i>Zidan Kurnia Arief Pratama, Bambang Sugiarto, Slamet Risnanto, Gunawansyah, Adriadi Doni Romdhoni Witarsa</i>	
A Machine Learning-Based Web Dashboard for Public Sentiment Analysis of Regional Elections Using Random Forest	438
<i>Fikri Fauzian, Slamet Risnanto, Gunawansyah, Rini Nuraini Sukmana, Didin Saepudin, Nurhaeni Sikki</i>	