

IET International Conference on Engineering Technologies and Applications (ICETA 2025)

IET Conference Publications 980

Taoyuan, Taiwan and Online
24-26 October 2025

ISBN: 979-8-3313-3901-2

Printed from e-media with permission by:

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



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2025) by the Institution of Engineering and Technology
All rights reserved.

Printed with permission by Curran Associates, Inc. (2026)

For permission requests, please contact the Institution of Engineering and Technology
at the address below.

Institution of Engineering and Technology
Futures Place, Kings Way
Stevenage, Hertfordshire
U.K. SG1 2UA
United Kingdom

Phone: +44 (0)1438 313311

www.theiet.org

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
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Immersive Defensive Driving Training System	1
<i>Sirius He, I. A. Wu</i>	
Development of Multi-User Immersive Collaborative Training System for Hot Work.....	3
<i>Sirius He, I. A. Wu</i>	
Implementation of Industrial Production Development Framework for Fingerprint Application in Normal Sensing-Fingerprint Keycap Device.....	5
<i>Yi-Pin Hsu, Yu-Sheng Lin, Ssu-Yun Liu, Rui-Wen Wu</i>	
A Study on the Effects of Refractive Index and Geometrical Variations in Femtosecond Laser- Written Lithium Niobate Waveguides	7
<i>Fu-Li Hsiao, Ni-Yen Lee, Yu-Long Shih, Li-Chaun Yu</i>	
Optimization of high-Q Surface Acoustic Wave Resonators using Cylindrical Phononic Crystal Structures.....	9
<i>Fu-Li Hsiao, Yu-Long Shih, Ni-Yen Lee, Ying-Pin Tsai, Fathur R. Alhadi</i>	
Generative AI for Cultural Heritage Restoration: Reconstructing Lost Artifacts and Ancient Texts.....	11
<i>Wai Y. Leong</i>	
Generative AI for Synthetic Multimodal Healthcare Data Generation.....	13
<i>Wai Y. Leong</i>	
Stability Enhancement of a Grid-Connected Wind Doubly-Fed Induction Generator using a Vanadium Redox Flow Battery-Based Energy Storage System	15
<i>Li Wang, Meng-Chian Li, Wei-Yow Hsu, Jyun-Hao Hu</i>	
Stability Improvement of a Grid-Connected Wind Permanent Magnet Synchronous Generator using a Vanadium Redox Flow Battery-Based Energy Storage System.....	17
<i>Li Wang, Meng-Chian Li, Wei-Yow Hsu, Jyun-Hao Hu</i>	
Software Testing for HMI System using Robotic Arm and Object Detection	19
<i>Zhi-Kai Chen, I-Pin Chang, Wei-Pei Chen, Chuan-Kai Yang, Hsing-Yu Chen, Tien-He Chen</i>	
Taming the Mirage: A Taxonomy of Detection Methods for LLM Hallucinations	21
<i>Zhao-Yu Hu, Meng-Luen Wu</i>	
Stability Analysis of Integrating a Floating Offshore Wind Farm with Renewable Energy Farms Fed to a Multimachine Power System Through a Multi-Terminal High-Voltage Direct-Current Link Based on a Modular Multilevel Converter	23
<i>Li Wang, Guan-Wei Li, Jyun-Hao Hu, Ching-Chuan Tseng, Hazlie Mokhlis, Kein H. Chua, Manoj Tripathy</i>	
Stability Analysis of Hybrid Renewable Energy Systems Fed to a Multimachine Power System Through a High-Voltage Direct-Current Link Based on a Modular Multilevel Converter using Grid- Forming Converter Control with Particle Swarm Optimization.....	25
<i>Li Wang, Ping-Chang Lin, Wei-Jie Zhang, Ching-Chuan Tseng, Hazlie Mokhlis, Kein H. Chua, Manoj Tripathy</i>	

Stability Improvement of a Hybrid Renewable Energy System using an Energy Storage System Integrated with a Genetic Algorithm-Based Damping Controller	27
<i>Li Wang, Yu-Hsien Tseng, Ying-Bow Liao, Ching-Chuan Tseng, Hazlie Mokhlis, Kein H. Chua, Manoj Tripathy</i>	
Reinforcement Learning-Based Automatic Generation Control on Frequency Regulation and Stability Improvement of a Multimachine Power System with a Large-Scale Wind Farm	29
<i>Li Wang, Yu-Ju Lee, Ji-Long Ke, Ching-Chuan Tseng, Hazlie Mokhlis, Kein H. Chua, Manoj Tripathy</i>	
A Day-Ahead Wind Speed Forecasting using Federated Learning Approach for Distributed Weather Stations	31
<i>Ying-Yi Hong, Daryll J. Medina</i>	
An Improved Steganographic Scheme to Address Reference Pixel Capacity Loss.....	33
<i>Kanza Fatima, Chi-Shiang Chan, Cheng-Ying Yang, Min S. Hwang</i>	
Energy Harvesting from Soldiers' Movements: A Piezoelectric Approach for Portable Military Electronics	35
<i>R. R. G. S. N. Senarathna, Suren Fernando, D. M. S. S. Delgamuwa</i>	
Evading Sequential Detection Models with GAN-Based Adversarial Log Generation.....	37
<i>Zheng-Xun Cai, Chia-Mei Chen, Jin-Wei Liu, Gu-Hsin Lai, Ya-Hui Ou</i>	
The Refractive Index Measurement of Seawater Based on a Displacement Sensor.....	39
<i>Meng-Chang Hsieh, Yu-Chi Chung, Hsiu-Tzu Hsu</i>	
Application of a Low-Computation-Complexity Enhancement Method on Low-Quality Fingerprint Images Based on the Use of an Autoencoder	41
<i>Yi-Pin Hsu, Ssu-Yun Liu, Rui-Wen Wu, Yu-Sheng Lin</i>	
A Novel Multi-Objective Trajectory Optimization Approach for Drone Swarms	43
<i>Zhang Ziang, Zhenjiang Zhang, Wang Yujier</i>	
Predicting Urban EV Charging Demand: A Geospatial Analysis using Real-Time Connected Car Data, Charging Infrastructure and H3 Indexing	45
<i>Kunal Mishra, Archana Dixit</i>	
Generative AI in Sustainable Fashion: Automating Ethical and Eco-Friendly Designs	47
<i>Wai Y. Leong</i>	
Generative AI-Driven Urban Planning for Net-Zero Emissions Cities	49
<i>Wai Y. Leong</i>	
Generative Policy Design: AI for Simulating Sustainability Governance Frameworks	51
<i>Wai Y. Leong</i>	
AI-Based Quality Inspection and Defect Detection in Real-Time Manufacturing Environments.....	53
<i>Wai Y. Leong</i>	
Design of Temperature Detection and Protection System for Wireless Charging Transmitter Chip	55
<i>Lian-Feng Ren, Fan Jiang</i>	
An On-Chip Relaxation Oscillator Circuit with Positive Temperature Compensation.....	57
<i>Fan Jiang, Han-Ling Wang, Shi-Kai Zuo</i>	

Design of IGBT Based on Carrier Storage Layer	59
<i>Rui-Sen Chen, Li Chen</i>	
Dummy Trench Gate Design for Enhancing Short-Circuit Capability in 1200V IGBT	61
<i>Li Chen, Rui-Sen Chen</i>	
An UAV-Based Routing Inspection Method for Traffic Condition Monitoring	63
<i>Wei-quan Li, Songlin Wei, Hsuan-Ming Feng</i>	
The Strategy of Job-Scheduling for Grid Computing	65
<i>Xiao-Peng Lin</i>	
From Blueprint to Quote in Minutes: A Lightweight CLIP-Based Solution for Drawing Similarity Search	67
<i>Chia-Pei Lee, Li-Ling Hsieh, Ying-Hsu Chen, Yung-Hsing Peng, Yu-Ching Chuang</i>	
Multi-Agent AI-Assisted Python Development System	69
<i>Cheng-Han Chang, Zhe-Wei Wu, Jau-Yang Chang, Jin-Tsong Jeng</i>	
An Intelligent Game Assistant Based on Voice Generation and LLaMA 3 Language Model	71
<i>Yan-Fu Chen, Wen-Chien Lo, Jin-Tsong Jeng</i>	
An Effective Anomaly Detection Scheme Against GPS Spoofing and Jamming in UAV Systems	73
<i>Ying-Chen Liu, Kuo-Hui Yeh, Yi-Zheng Chen, Yu-Jen Wan</i>	
On the Directed Dimension-Balanced Hamiltonian Cycle Problem	75
<i>Justie Su-Tzu Juan, Guan-Ting Lai, Hung-Chi Huang, Chi-Li Wang</i>	
Designing an Improved ULCL UPF Architecture in the 5G Core Network	77
<i>Hung-Ming Chen, Yung-Feng Lu, Ming-Han Li, Guan-Bo Fang</i>	
The Design of a GPU-Aware Scheduler for LLM Tasks	79
<i>Hung-Ming Chen, Yung-Feng Lu, Tsan-Yi Yang, Bing-Han Ho</i>	
Enhancing Long-Term Traffic Prediction Through Hybrid TimesNet-Informer Architecture	81
<i>Chun-Chi Ting, Kuan-Ting Wu, Shinfeng Lin</i>	
Numerical Investigation of Second-Order Diffraction in Asymmetric Grating Structures	83
<i>Fu-Li Hsiao, Wen-Lang Hung, Bo-Hui Chen, Ying-Ping Tsai, Hung-Lin Yang</i>	
Design of an Auto-Scaling Mechanism for Pub/Sub Microservices	85
<i>Hung-Ming Chen, Yung-Feng Lu, Shih-Ying Chen, Yu-Lun Shih, Po-Wei Liu</i>	
A Study on Foggy Image Enhancement Based on the Dark Channel Prior	87
<i>Shang-En Tsai, Wei-Cheng Sun</i>	
LiteYOLOv8: A Lightweight and Efficient Architecture for Real-Time Pedestrian Detection	89
<i>Saad Tariq, Rung-Ching Chen</i>	
From Raw Data to Actionable Insights: Integrating Generative Artificial Intelligence in the Metagenomics Bioinformatics Pipeline	91
<i>Tsz H. Kwan, Denise P. C. Chan, Cheuk H. A. Chow, Chin P. Chan, Shui S. Lee</i>	
Weakly Supervised Watermark Removal using Multi-View Visual Models and Inpainting	93
<i>Yi-Jui Huang, Chia-Cheng Liu, Syuan-Hao Li, Jie-Xin Li</i>	

Intelligent Screwdriver System with Motion Recognition using 1D Convolutional Neural Networks	95
<i>Ching-Han Chen, Kai-Wen Ku, Kai-Jie Lin</i>	
Off-Line Visual AI Agent on NVIDIA Jetson Orin Nano.....	97
<i>Alejandro P. Maestre, Pranamita Guha, Thomas Schumann</i>	
Multi-Cam AI Video Analytics using NVIDIA DeepStream SDK 7.1	99
<i>Abhiram Anil, Agilan V. Saminathadurai, Dheeraj S. S. Mahesh, Divya R. Teli, Farzad Mehrdad, Prajwal Mangaluru, Shilpa Gopakumar, Thomas Schumann</i>	
Enhanced RAG Retrieval via Semantic Keywords and Dynamic Expansion	101
<i>Kuo-Yu Kai, Chih-Chuan Chang, Tsung-Chih Hu, Jing-Tian Sung</i>	
Design of a Driving Safety Assistance System Based on YOLO Technology	103
<i>Cheng-Yuan Tsai, Guan-Chen Ou, Sheng-Shou Wang, You-Dong Liang, Ching-Min Lee</i>	
Lower and Upper Bounds for Degree-Dependent Spanning Tree Problems	105
<i>Massinissa Merabet, Matthieu Desprez</i>	
Time-Selective EEG Feature Extraction for Emotion Recognition.....	107
<i>Hsuan-Ju Chen, Jennifer Yang, Chiao-Yu Chen, Wei-Min Liu</i>	
Graph Embedding-Enhanced GNN for Scalable D2D Power Control	109
<i>Hung-Chin Jang, Tung-Lin Wu</i>	
Adaptive Kubernetes Autoscaling via Data-Driven Prediction and Modular Stability Filtering.....	111
<i>Hung-Chin Jang, Sheng-Tai Wang</i>	
Spatiotemporal Parking Prediction and Route Optimization.....	113
<i>Hung-Chin Jang, Kuan-Hung Yeh</i>	
Comparative Clustering Strategies for Network Slicing	115
<i>Hung-Chin Jang, Wei-Ya Liao</i>	
UWB-Based Smart Home System with Adaptive Calibration and Gesture Recognition	117
<i>Hung-Chin Jang, Hung-Hsuan Hsieh</i>	
Smart Aquaculture Transformation: A Case Study of Scortum Barcoo Farming in Pingtung, Taiwan	119
<i>Chin-Mu Weng, Li-Ling Hsieh, Mei-Ling Tsai, Yung-Hsing Peng, Ying-Hsu Chen</i>	
Real-Time Stereo Vehicle Detection and Collision Warning System Based on YOLOv8 and SGBM.....	121
<i>Shang-En Tsai, Chia-Han Hsieh</i>	
A Binary Line Segment Filter for Image Sensors: Enabling Robust Real-Time Lane Detection in Challenging Conditions	123
<i>Shang-En Tsai, Shih-Ming Yang, Yu-Hung Wang</i>	
Towards Distributed Multiagent Learning for Finding Linear Arrow-Debreu Market Equilibria: Projection-Free Optimistic Gradient Descent Ascent (Extended Abstract).....	125
<i>Po-An Chen, Chi-Jen Lu, Chuang-Chieh Lin, Jing Huang</i>	
Influence of Contact Characteristics of Machine Tool Supports with Varying Arc Radii on the Vertical Straightness of Guideway Mounting Surfaces	127
<i>Po-Hsiang Chuang, Li-Wei Tseng, Wei-Lun Huang</i>	

Multi-Robot Patrol-Scheduling with Min-Max Latency on Stars	129
<i>Li-Hsuan Chen, Wing-Kai Hon, Ling-Ju Hung, Pei-Hsuan Hsu, Ching-Kai Wang, Hao-Tsung Yang</i>	
Three-Vertex-Constrained Bipancyclicity of Hypercubes	131
<i>Xiawei Zhang, Hong Chen, Jinpeng Hua, Eddie Cheng, Laszlo Liptak, Cheng-Kuan Lin</i>	
A Novel FaceNet Method Combined with Wavelet Transform and a Multi-Stage Loss Function for Identity Recognition	133
<i>Young-Long Chen, Hsin-Chuan Lu, Yi-Yang Liu, Ling-Wei Lin</i>	
Constructivist Learning for Advancing Programming Abilities in Female High School Students	135
<i>Jung-Huang Hsu, Sin-Yin Chang, Chih-Hsien Hsia</i>	
YOLO with Attention Mechanisms for Building Cracks Detection	137
<i>Jing-Yu Lai, Ching-Yu Tsai, Chih-Hsing Yang, Chia-Min Lin, Jen-Shiun Chiang</i>	
A Fusion Deep Learning Model to Enhance the Accuracy of Humerus Fracture Diagnosis	139
<i>Ihsanul Azmi, Chuan-Ming Liu</i>	
A Design of Green Plant Circulation System	141
<i>Chih-Ling Kang, Ting-Yu Wu, Sheng-Lung Peng, Ling-Ju Hung</i>	
Microstructure of FeNiCoAlCrB High Entropy Alloys	143
<i>Li-Wei Tseng, Po-Hsiang Chuang</i>	
A Photovoltaic Power Generation Forecasting System Based on Dual-Pyranometer Measurements	145
<i>Tsai-Jiun Ren, Yu-Chin Liao, Ssu-Yuan Huang, Li-Shan Chang</i>	
A Sub-Sampling PLL Incorporating a Merged Dual-Loop Charge Pump and an Area-Efficient Capacitor-Multiplied Loop Filter	147
<i>Wei-Bin Yang, Hsiao-Yen Peng</i>	
A Network Slicing Dynamic Resource Allocation Algorithm for Vehicular Ad-Hoc Networks	149
<i>Linghui Qiu, Zhenjiang Zhang, Feng Leng</i>	
Deep Learning-Enhanced Task Offloading Strategy for Internet of Vehicles: Dynamic Optimization Based on Local-Edge-Cloud Collaborative Framework	151
<i>Qingyu Zhao, Yingsi Zhao</i>	
GNN-Diffusion-LSTM Hybrid Model for Spatial-Aware Anomaly Detection in Internet of Vehicles	153
<i>Qianli Yang, Jianjun Zeng</i>	
Large-Model-Driven Anomaly Behavior Recognition in Intelligent Connected Vehicles	155
<i>Jianjun Zeng, Jianguo Wei, Jilin Zhang</i>	
CC-YOLOv9-E for Vehicle and Pedestrian Detection at Campus Entrances	157
<i>Min-Fang Xiao, Chun-Ming Tsai</i>	
Effect of Heat Treatments on FeCoNiAlTiNb High Entropy Alloy Thin Films	159
<i>Chau-Yi Tsai, Liang-Yan Shen, Meng-Ruwu, Jung-Wei Wu, Jing-Wei Li, Hung-Jiun Nian, Wei-Ting Li, Wen-Kefan, Yu-Kai Chang, Han-Shian Huang, Kuang-Lin Chu</i>	
A Conversational Generative AI-driven Advertising Recommendation Framework for Personalized Travel Planning	161
<i>Hsing-Tung Ho, Wei-Yu Chen</i>	

Stability Analysis of an Offshore Wind Farm Integrating with a Hybrid Energy Storage System Fed to a Multimachine Power System Through a Modular Multilevel Converter-Based High-Voltage Direct-Current Link using a Grey Wolf Optimization Controller.....	163
<i>Li Wang, Meng-Chien Li, Wei-Yow Hsu, Ching-Chuan Tseng, Hazlie Mokhlis, Kein H. Chua, Manoj Tripathy</i>	

Author Index