

PROCEEDINGS OF THE 2ND INTERNATIONAL CONFERENCE ON

Artificial Intelligence, Modern Engineering & Environmental Sustainability

IC-AIMEES 2026

International Conference on Artificial Intelligence, Modern Engineering and Environmental Sustainability

Zurich, Switzerland | May 13–15, 2026

EDITOR-IN-CHIEF

Prof. Olga Morozova

Vol. 14 · 2026

E-ISSN 3105-0522

P-ISSN 3105-0514

IC-AIMEES 2026

IC-AIMEES Conference Organizing Committee

PROCEEDINGS OF THE 2ND INTERNATIONAL CONFERENCE
ON ARTIFICIAL INTELLIGENCE, MODERN ENGINEERING
AND ENVIRONMENTAL SUSTAINABILITY
(IC-AIMEES 2026)

Vol. 14

Editor-in-Chief

Prof. Olga Morozova

**VOL. 14 (2026):
PROCEEDINGS OF THE 2ND INTERNATIONAL
CONFERENCE ON ARTIFICIAL INTELLIGENCE,
MODERN ENGINEERING AND ENVIRONMENTAL
SUSTAINABILITY (IC-AIMEES 2026)**

Zurich, Switzerland | May 13–15, 2026

Exploring Science Academic Conference Series

E-ISSN: 3105-0522 P-ISSN: 3105-0514

DOI Prefix: 10.70267 Email: secretary@zeupconference.com

COPYRIGHT © 2026 THE AUTHOR(S)

PUBLISHED BY: ZEUS PRESS

Address: Flat/Rm 91_3 9/F Chinachem Golden Plaza No.77 Mody Road Tsim Sha Tsui KL, Hong Kong

Individual paper REPRINTS may be ordered at: sherlene@zeupconference.com

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-Non Commercial 4.0 International License

(<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any

medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and

indicate if changes were made.

Preface

It is our pleasure to present the *Proceedings of the 2nd International Conference on Artificial Intelligence, Modern Engineering and Environmental Sustainability (IC-AIMEES 2026)*, held in Zurich, Switzerland, from May 13 to 15, 2026. This volume brings together a wide range of studies exploring how artificial intelligence, advanced engineering, and environmental technologies are reshaping scientific research, industrial practice, and contemporary society.

Artificial intelligence is no longer confined to a single technical field. It has become a general-purpose force that increasingly influences manufacturing, healthcare, transportation, communication, environmental management, business, and public decision-making. Yet technological capability alone is an inadequate measure of progress. Questions of reliability, interpretability, security, sustainability, and social responsibility have become equally urgent. IC-AIMEES 2026 was therefore conceived as an interdisciplinary forum where researchers could examine both the possibilities created by emerging technologies and the difficult problems accompanying their adoption.

The papers collected in this volume reflect the breadth of this agenda. They address large language models, dialogue systems, computer vision, machine learning, multimodal computing, natural language processing, intelligent fault diagnosis, autonomous systems, and AI-assisted medical decision-making. Other contributions examine graphene-based electronic devices, mechanical metamaterials, soft robotics, micro-nano memristors, electric-vehicle charging, satellite orbit control, additive manufacturing, machine vision, and industrial scheduling. Together, these studies illustrate the growing integration of computational intelligence with modern engineering systems.

Environmental sustainability constitutes another central strand of the volume. The included research investigates meteorology and air quality, atmospheric-pollution prediction, biochar adsorption mechanisms, water-treatment optimization, battery-discharge behaviour, green buildings, urban traffic, and the application of geographic information systems to energy infrastructure. These contributions demonstrate that environmental challenges cannot be treated as peripheral constraints on technological development. Sustainability must be embedded in the design, operation, and evaluation of future engineering systems from the outset.

The volume also confronts the limitations and risks of technological innovation. Several papers examine AI-generated content, model integrity, privacy protection, machine unlearning, algorithmic interpretability, chatbot-assisted psychotherapy, and artificial intelligence in judicial decision-making. Such work is particularly valuable. Innovation without critical scrutiny quickly becomes technological theatre: impressive in appearance, but fragile in practice. Responsible progress requires systems that are not only powerful, but also transparent, secure, accountable, and responsive to human needs.

We extend our sincere appreciation to all authors for sharing their research through IC-AIMEES 2026. We also thank the reviewers, members of the Conference Organizing Committee, editorial staff, and supporting institutions whose professional commitment made this conference and the publication of its proceedings possible.

We hope that this volume will stimulate further research and interdisciplinary cooperation across artificial intelligence, engineering, environmental science, and related fields. More importantly, we hope it will encourage a vision of innovation in which technical advancement and environmental responsibility reinforce, rather than undermine, one another.

Prof. Olga Morozova

Editor-in-Chief

IC-AIMEES 2026 Conference Proceedings

Contents

Comprehensive Influence of Meteorology on Air Quality	1
<i>Haoran Shuai</i>	
Analysis of Semantic Disambiguation Techniques in Dialogue Systems.....	8
<i>Xinyue Liu</i>	
A New Paradigm of Active Defense System Based on Large Language Models	15
<i>Shujing Xiang</i>	
Preparation Technologies and Applications of Graphene-Based Paper Electronic Devices	24
<i>Jiabao Zhang</i>	
Commonsense-Guided VLMs for 2D Fully UnobservedObject Detection	32
<i>Ye Liu</i>	
Unveiling the Mechanisms Between Writing Style and Academic Impact: A Multidimensional and Machine Learning Perspective	41
<i>Ruixuan Yu</i>	
Demand-Oriented Renovation Strategies for Public Spaces in University Dormitory Squares: A Case Study of the LZH Campus at North China University of Water Resources and Electric Power.....	61
<i>Jiaxuan Yu</i>	
Limitations of AI-Generated Content and Strategies for Enhancement	71
<i>Weihang Gao</i>	
Applications of Machine Learning in Additive Manufacturing.....	78
<i>Zicheng Qu</i>	
A Discussion on the Similarities Between Mechanical Metamaterials and Soft Matter and the Possibilities for Their Combined Development	84
<i>Jiarui Zheng</i>	
Design of Lightweight Vision System for Agricultural Drones: Real-time Identification of Crop Diseases under Complex Lighting Conditions.....	90
<i>Yinlai Zhang</i>	
The Closed-Loop Construction of Soft Robot Perception, Decision-Making, and Control Under the Cyber-Physical Systems (CPS) Framework.....	97
<i>Yang Yue</i>	

Unveiling the Future of Olympic Glory	105
<i>Anlan Zheng, Yiran Tang</i>	
A Review of Industrial Fault Diagnosis Technologies Based on Machine Learning	124
<i>Siying Chen</i>	
Application Prospects and Challenges of Micro-Nano Memristors.....	135
<i>Xiangyi Li</i>	
Inclusive-Oriented, AI-Driven Mental Health Services for All Age Groups: Research on Challenges and Optimization Strategies	143
<i>Junyu Wang, Zhuohang Zou, Youxuan Hu, Yijie Huang, Chengyun Zhu, Yuhan Guo, Ziyu Wang, Xiaoya Zhou</i>	
A Review of Deep Learning-Based Intelligent Fault Diagnosis Methods for Rotating Machinery under Small-Sample Conditions.....	162
<i>Ziqi Wang</i>	
Research Progress on the Adsorption Mechanisms of Biochar for Atmospheric Pollutants	168
<i>Jiawei An</i>	
Machine Learning and Intelligent Optimization Algorithms: Principles of DLSS and Cross-Industry Applications	174
<i>Zihong Wu</i>	
Digital Vitality, Finite Energy: A Continuous-Time Framework for Battery Discharge Behavior.....	183
<i>Heguang Luan, Guangning Wang, Yuxuan Lu, Tianrui Chen</i>	
An Interpretability Study of the Air Quality Index in Lanzhou City Based on Random Forest.....	204
<i>Guoxuan Zu</i>	
Application of Artificial Intelligence and Large Language Models in Clinical Decision-Making for Diabetes	211
<i>Hanyu Yang</i>	
Application of Artificial Intelligence Optimization Algorithms Coupled with Machine Learning in Water Treatment Process Optimization and Water Quality Prediction	220
<i>Xinwei Liu</i>	
Analysis of the Bottlenecks and Solutions for Enhancing the Capabilities of Large Language Models.....	226
<i>Yihan Wang</i>	
Revisiting Challenger: A Probabilistic Decision-Support Framework Using Bayesian Inference.....	232
<i>Zewei Zhang</i>	

Research Progress and Prospects of Fragile Watermarking for Model Integrity Protection	243
<i>Zixin Zhou</i>	
Design of Electric Vehicle Wireless Charging System Based on Series Resonant Circuit	252
<i>Jiaqi Zhang</i>	
Anti-jamming Technology for Integrated Communication and Sensing of Unmanned Aerial Vehicles under Obstacle Factors	259
<i>Huiyu Liang</i>	
A Review of Automatic Text Summarization Quality Evaluation Based on Attribution Explainability	266
<i>Yingying Qi</i>	
A Multi-Model Predictive Analysis of China's Pet Industry Development: Market Trends, Global Demand, and Strategic Responses to Foreign Economic Policies	271
<i>Gaojiayue Shen</i>	
A Review of Surface Defect Detection Technologies Based on Machine Vision	291
<i>Ruihong Zhang</i>	
A Systematic Review on Architecture, Applications, and Challenges of Large Model-Driven Intelligent Business Information Systems	299
<i>Kejia Wang</i>	
A Review of Multimodal Affective Computing in the Field of Mental Health Monitoring.....	307
<i>Shunyao Zhang</i>	
Utilizing Cryptography to Decrease Privacy and Security Risks in Machine Unlearning	317
<i>Xun Zhang</i>	
Artificial Intelligence and Data Science in the Transformation of Internet Business Models.....	326
<i>Xi Han</i>	
A BERT-Based Interpretable Deep Learning Model for Medical Diagnosis Assisted by Natural Language Processing.....	334
<i>Yutong Chen</i>	
A Review on the Application of Artificial Intelligence and Multi-source Data in Refined Prediction of Atmospheric Pollution.....	340
<i>Chengbo Zheng</i>	
Artificial Intelligence in Judicial Decision-Making: Risks, Due Process, and Governance Frameworks	347
<i>Yi Liu</i>	

Low-Rank Adaptation (LoRA) for Visual Art Style Learning and Feature Fusion: A Narrative Review	354
<i>Jialang Liu</i>	
Research on Energy-Efficient Multi-Objective Satellite Orbit Control Based on Deep Reinforcement Learning	361
<i>Ruihan Zhang</i>	
Application Risks of Artificial Intelligence Chatbots in Psychotherapy and Feasible Solutions for Legal and Policy Issues	370
<i>Chuyu Wang</i>	
A Review of Mixed Batch Scheduling with Fuzzy Processing Times on Parallel Machines.....	376
<i>Dongyu Yang</i>	
Integrating Speech into Large Language Models: Architectures, Training Strategies, and Emerging Challenges	384
<i>Jiajun Li</i>	
Digital Visualization and Siting Optimization of Power Plants Using High-Resolution Meteorological Data and GIS	393
<i>Pengyu Wang</i>	
Research on Cross-modal and Semantic Collaborative Unsupervised Domain Adaptation for All-weather Autonomous Driving Perception Enhancement.....	400
<i>Zhuochao Du</i>	
AI-Assisted 3D Modeling and Engineering Optimization of Artistic Mechanical Parts for TWS Earbud Charging Cases.....	407
<i>Jiayi Qi</i>	
Artificial Intelligence in the Management of Chronic Diseases: Opportunities, Challenges, and Future Directions	414
<i>Ningxin Zhou</i>	
From RNN to Transformer: A Review of Neural Network Architectures for Sequence Modeling in Time Series Prediction.....	421
<i>Qintian Li</i>	
Research and Analysis of NLP Based Motion Understanding Large Language Model from Perception to Cognition	428
<i>Chenyang Xue</i>	
A Review of Collaborative Research on BIM Technology in the Whole Life Cycle of Green Buildings	435
<i>Xuanhang Chen</i>	

Short-term Traffic Flow Prediction at Urban Intersections Based on Quantile Regression and Bayesian Networks	447
<i>Yuanzhuo Xie</i>	
AG-BiLSTM: A Hybrid Deep Learning Model for Olympic Medal Prediction	454
<i>Junyao Xu</i>	