# Foreword

## Special issue on Intelligent Media and Sustainable Technology Management

The rapid breakthroughs in information technologies have driven substantial developments in artificial intelligence (AI) applications, particularly the widespread use of deep learning techniques and generative AI in domains such as speech, image, and text recognition. Nowadays, AI utilizes machine learning and deep learning techniques to construct Intelligent Media and to provide sustainable technology solutions. Sustainable Technology Management refers to the practice of using technology in a way that minimizes environmental impact and maximizes long-term sustainability. Therefore, there is an increasing need for a more complete understanding of Intelligent Media and Sustainable Technology Management.

The International Conference on Intelligent Media and Sustainable Technology Management (IMSTM) was first organized in Japan in 2019 and provides a forum for the presentation of the latest research results in Intelligent Media and Sustainable Technology Management. This special issue of the Journal of Information Science and Engineering includes excellent papers presented at IMSTM 2025 and original contributions that address technologies and applications of Intelligent Media and Sustainable Technology Management. All submitted papers were reviewed by at least two reviewers and selected based on their originality, significance, relevance, and clarity of presentation. Eight papers were accepted for this special issue.

The accepted papers are grouped into three topics: digital literacy and sustainable technology management in higher education; AI-driven modeling for sustainable finance, FinTech, and supply chains; and intelligent media and user acceptance of AI-driven services.

The first paper, "How Higher-Order Skills and Online Learning Drive Undergraduates' Digital Literacy, Technology Motivation, and Sustainable Technology Management? An Empirical Analysis" by Yuen et al. (2026), investigates which skills contribute to undergraduates' digital literacy and how digital literacy affects their motivation to use technology. The authors surveyed 216 students at two universities in Hong Kong and analyzed the data with partial least squares structural equation modeling (PLS-SEM), based on a four-skill framework of digital literacy and expectancy theory. Thinking skills, collaboration skills, and

awareness skills all have significant positive effects on digital literacy. Basic operational skills have no significant effect. Prior online-learning experience also improves digital literacy, and IT competency moderates the effects of awareness skills and online-learning experience. Digital literacy in turn has positive effects on both performance expectancy and effort expectancy. The authors suggest that university curricula should emphasize critical evaluation, collaboration, and digital ethics rather than basic operational skills, in order to prepare students for the responsible management of digital technology.

The paper "Systemic Risk Prediction Model for the Green Financial Market Based on GCN-LSTM" by Song et al. (2026) proposes a prediction model for systemic risk in China's green financial market. A time-varying parameter vector autoregression (TVP-VAR) model with generalized forecast error variance decomposition is first used to measure volatility spillovers among 11 green financial sub-markets, using daily data from 2008 to 2023. The spillover network is then used as the graph structure of a model that combines a graph convolutional network (GCN) with a long short-term memory (LSTM) network. The spillover analysis shows that the green stock market is the main transmitter of risk, while green bonds, green funds, and the carbon market are mainly receivers. In the prediction experiments, the GCN-LSTM model reaches an average $R^2$ of 0.826 and outperforms a standalone LSTM model. The authors suggest that the framework can be used for early warning of systemic risk and for regulatory decision making.

Zhang and Liu (2026), in "The Stackelberg Game Model for Efficiency Optimization of Cross-Border E-Commerce Logistics Service," propose a Stackelberg game model for cross-border e-commerce logistics services, in which leading enterprises such as cross-border platforms and core logistics providers decide service pricing, quality standards, and resource allocation, and following enterprises such as transportation companies and warehouses respond with their own transportation, cost, and service strategies. The model is tested in two simulation experiments, with parameters derived from the World Bank Logistics Performance Index data, over short, medium, and long transport distances. According to the results, average transit time is reduced by about 19%, order processing time by about 20%, and transportation, warehousing, and order processing costs by 17–18%, while the delivery punctuality rate increases from about 83% to about 90%. The authors note that the improvements are most pronounced for long-distance transport.

Stock prediction is difficult because financial market data are high-dimensional, nonlinear, and noisy. Lyu et al. (2026), in "Predicting Market Capitaliza-

tion and Unraveling the Pricing Mechanism of New Quality Productivity: A Deep Learning Approach," propose a stock prediction method that combines an improved flower pollination algorithm (FPA) for feature selection with a CatBoost classifier. The improved FPA uses an adaptive switching probability and a random walk strategy to avoid local optima, and CatBoost is chosen because it handles categorical and numerical features directly. The feature selection algorithm is first compared with five other metaheuristic algorithms on the UCI bank marketing dataset. The complete model is then applied to next-day rise/fall prediction for 150 constituent stocks of the CSI 300 Index from 2020 to 2023 and compared with LSTM, GRU, XGBoost, LightGBM, and random forest. The proposed model gives the best accuracy, recall, F1 score, and AUC, and its performance is stable in bull and bear markets and in several abnormal market periods, such as the early stage of the COVID-19 pandemic in 2020.

Huang et al. (2026), in "Automatic Deep Multi-Task Learning for Applications in Financial Technology," present a forecasting system for stock indices that combines the empirical wavelet transform (EWT) with a deep multi-task learning (DMTL) model based on tensor factorization. EWT decomposes each index series into multi-scale components, and the DMTL model treats the indices as related tasks and learns at each layer how much knowledge should be shared among them, and therefore the sharing structure does not need to be specified manually. The system is tested on daily data of seven major indices, including the S&P 500, Nikkei 225, and TWII, from 2018 to 2020, and reports lower average RMSE and MAE than a feed-forward neural network, a generalized regression network, and an ARIMA model.

The paper "Optimizing Multi-Class Text Classification Using Hybrid Deep Learning Models: A Comparative Study of BERT, BiLSTM, and CNN Architectures" by Abu-Al-Aish et al. (2026) proposes a hybrid architecture for text classification in which a CNN branch captures local phrase-level features, a BiLSTM branch captures long-range dependencies, and a BERT representation provides contextual information. The three representations are combined through a gated fusion layer, and the model is trained end to end. On three public datasets (AG News, IMDb, and Yelp Polarity), the hybrid model outperforms standalone CNN, BiLSTM, and fine-tuned BERT models in accuracy and macro-averaged F1, and an ablation study confirms the contribution of each component. The authors also report training time, memory usage, inference latency, and throughput, and show that the training and inference costs are only moderately higher than those of fine-tuned BERT.

Lin et al. (2026), in "Validating the Conversion Power of AI Copy via AIDA:

Evidence from Restaurant Advertising," compare restaurant advertising copy generated by ChatGPT with copy written by advertising professionals under the AIDA (Attention-Interest-Desire-Action) model. In a between-subjects experiment, 141 respondents evaluated the AI-generated copy and 137 respondents evaluated the expert-written copy for the same restaurant, without knowing the source of the copy. The study examines how three copy features (perceived aesthetics, narrative structure, and self-reference) influence consumption intention through interest and desire, and analyzes the two groups separately with PLS-SEM. The results show that both types of copy follow the AIDA sequence, although the significant paths are different for the two groups. For the AI-generated copy, self-reference is effective in arousing interest, and interest influences consumption intention only indirectly through desire. For the expert-written copy, interest has a direct effect on consumption intention, and the overall effect on consumption intention is stronger. Based on these results, the authors suggest that generative AI can be used to produce first drafts, which are then revised by advertising professionals to strengthen the emotional appeal and the call to action.

The last paper, "Understanding Barriers to Robo-Advisor Adoption: An Empirical Investigation Based on Innovation Resistance Theory in Taiwan" by Liang et al. (2026), examines the barriers that make users in Taiwan resist robo-advisors, which provide automated investment and asset allocation advice. Robo-advisory services have been offered in Taiwan since 2017, but their adoption has remained lower than expected. Most previous studies examined the factors that promote adoption. This paper uses innovation resistance theory (IRT) to examine the barriers to adoption. Five barriers are considered: usage, value, and risk barriers (functional barriers) and tradition and image barriers (psychological barriers). The model is tested with PLS-SEM on 346 valid responses. The tradition barrier has the strongest effect on resistance, followed by the image barrier; the value barrier is also significant, while the usage and risk barriers are not. The authors discuss implications for banks and FinTech firms, and also for regulators and educators, in building public trust in AI-based financial services.

The eight papers in this special issue cover three topics: digital literacy and sustainable technology management in higher education; AI-driven modeling for sustainable finance, FinTech, and supply chains; and intelligent media and user acceptance of AI-driven services. Three of the eight papers use PLS-SEM on survey data, and the other five propose new models or algorithms, so the special issue covers both the management side and the technology side of the field. We hope that this special issue will be a useful reference for researchers

and practitioners in this area.

We would like to thank all the authors for their contributions and all the reviewers for their careful reviews. We are also grateful to the Editor-in-Chief and the editorial office of the Journal of Information Science and Engineering for their support of this special issue.

## • Introduction to Guest Editors •

**Hisashi Handa** is currently a Professor and the assistant dean in the Department of Informatics at Kindai University, Japan. His research interests include Evolutionary Algorithms, Computational Intelligence, Machine Learning, and Medical AI. He had served as an associate editor of SICE Journal of Control, Measurement, and System Integration. He received the 2009 ACM GECCO Best Paper Award.

**Yeu-Shiang Huang** is currently a Professor in the Department of Industrial and Information Management at National Cheng Kung University, Taiwan. His research interests include decision analysis, reliability engineering, supply chain management, operation management, and pricing. He has served as Editor in Chief for Asia Pacific Management Review and Associate Editor for Decision Support Systems. Related papers have appeared in such professional journals as INFORMS Journal on Computing, IIE Transactions, Naval Research Logistics, European Journal of Operational Research, Decision Support Systems, IEEE Transactions on Engineering Management, International Journal of Production Economics, Reliability Engineering and System Safety, IEEE Transactions on Reliability, Computers and Operations Research, Computers and Industrial Engineering, International Journal of Production Research, Communications in Statistics, Journal of Business Research, Group Decision and Negotiation, Systems Research and Behavioral Science, Software Testing, Verification and Reliability, and others.

**Kuo-Lun Hsiao** is a Professor of Information Management at National Taichung University of Science and Technology, Taiwan. He received his PhD in Information Management from National Taiwan University of Science and Technology. His research interests include electronic commerce, digital marketing, technology adoption, knowledge management, artificial intelligence, and emerging digital technologies. His recent work examines generative AI, digital consumer behavior, AI-supported learning, virtual commerce, and human-centered applications of intelligent information systems.

**Mu-Yen Chen** is a Distinguished Professor of Engineering Science at National Cheng Kung University, Taiwan. He is included in the career ranking of the TOP 2% of scientists in the world for 2022-2024, published by Stanford University (USA). His current research interests include artificial intelligent, soft computing, data mining, deep learning, context-awareness, machine learning, and social network mining with more than 200 publications in these areas. He has served as Editor in Chief and Associate Editor of international journals (e.g. Applied Soft Computing, International Journal of Big Data and Analytics in Healthcare, IEEE Transactions on Engineering Management, IEEE Access, Alexandria Engineering Journal, International Journal of Interactive Multimedia and Artificial Intelligence, and Human-centric Computing and Information Sciences) while he is an editorial board member on several SCI journals.