SPECIAL ISSUE ON NOVEL SENSORS, MATERIALS, AND RELATED TECHNOLOGIES ON ARTIFICIAL INTELLIGENCE OF THINGS APPLICATIONS: PART 1-2

PREFACE

In recent years, the booming economic development in Asia, particularly the leading manufacturing industries from automobiles, machinery, computers, communication, consumer products, and flat panel displays to semiconductors and micro/nano areas have attracted intense attention among universities, research institutions, and many industrial corporations. Therefore, applications of novel sensors, materials, and related technologies in electronic and mechanical devices have become rapidly developing fields. Manufacturing is the economic lifeline of a country and has been regarded as a labor-intensive industry. To reduce production costs, devices for the Internet of Things (IoT) have been widely developed. IoT is composed of most integrated end devices and facilities, such as intelligent sensors for internal control, industrial systems, mobile terminal systems, floor control systems, and home intelligent facilities. Smart devices and external control information are utilized with the hope of attracting companies that manufacture high-value-added products in the fields of aerospace, automotive, Information Technology (IT) molds, textiles, optoelectronics, watches, medical devices, automation, energy, and semiconductor-related parts and components to drive the country's economy. Therefore, the key to maintaining a competitive advantage in domestic manufacturing in the future still relies on the development of novel manufacturing and precision machinery-related technologies.

In addition, artificial intelligence (AI) is intelligence exhibited by machines, particularly computer systems. The artificial intelligence of things (AIoT) is the combination of AI technologies with IoT infrastructure to achieve more efficient IoT operations, improve human–machine interactions and enhance data management and analytics. The scope of this special issue entitled "Novel Sensors, Materials, and Related Technologies on Artificial Intelligence of Things Applications" covers fundamental and novel sensors, materials, and technologies related to AIoT for electronic, mechanical, and electrical engineering, including their synthesis and integration with many elements, the design of electronic and optical devices, sensing technologies, evaluation of various performance characteristics, and exploration of their broad applications to industry, environmental control, materials analyses, and so forth. In part 1-2 of this special issue, 14 excellent papers in two categories of sensors and materials fields have been selected.

(1) Related Technologies: "A Radial Basis Function Neural Network Approach for Detecting Wind Turbine Blade Damage via Embedded Accelerometer Data" by Hsu and Tan, and

"Application of Image Recognition Technology in Mechanical Bearing Damage Detection" by Chen *et al.*, and "Decision-making Algorithms Based on Artificial Intelligence" by Qian *et al.*, and "Analysis of Fire Propagation and Risk Network Based on Sensor Technology" by Qu *et al.*, and "Autonomous Obstacle Avoidance Path Programming Algorithm and Flight Validation for Fixed-wing Unmanned Aerial Vehicle in Formation" by Lee *et al.*

(2) Sensor Applications: "Integration of Sensor Technology in Education to Improve Learning Outcomes" by Zhu and Wu, and "English Education Using Robots for Effective Collaborative Language Learning" by Zhou and Wang, and "Sensor Technology to Enhance Employee Engagement and Company's Operational Efficiency" by Cheng *et al.*, and "Empirical Research into the Artificial Intelligence of Things Technology for the Effective Improvement of Global Healthcare" by Chang *et al.*, and "Design and Implementation of a Semi-automated Warehouse System for Smart Logistics in Urban Infrastructure" by Tsai *et al.*, and "Implementation of an AIoT-based Smart Parking System for Urban Mobility and Sustainable Infrastructure Management" by Tsai *et al.*, and "Design and Fabrication of a High-efficiency Light Absorber for Visible-spectrum Photodetectors" by Liao *et al.*, and "Design a Multiplanar Metamaterial Solar Absorber Using COMSOL" by Liao *et al.*, and "Employee Work Behavior Monitoring Using Multimodal Large Language Models" by Chen *et al.*

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