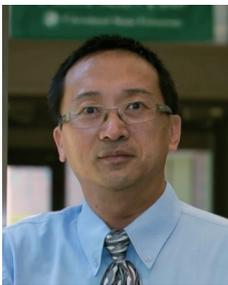


**SPECIAL ISSUE ON NOVEL SENSORS, MATERIALS, AND RELATED TECHNOLOGIES
ON ARTIFICIAL INTELLIGENCE OF THINGS APPLICATIONS: PART 4-1**

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 4-1 of this special issue, 12 excellent papers in three categories of sensors and materials fields have been selected.

(1) Physical/Mechanical Sensors: "Cognitive-behavioral Responses to Kitchen Cabinet Interfaces: Implications for Sensor-integrated Materials and Smart Usability Design" by Deng *et al.*

- (2) Related Technologies: “Effects of Smart Polymer-dispersed Liquid Crystal Window Film on Indoor Environment and Air-conditioning Electricity Consumption of Buildings in Taiwan” by Chang and Chen, and “Large Language Model-guided Data Augmentation for You Only Look Once Version 8-based Printed Circuit Board Defect Detection: Novel Human–AI Codesign Approach” by Lee *et al.*, and “Long-range-based Intelligent Farming Management System” by Lu *et al.*, and “Teaching Traditional Embroidery Using Digital Immersive Tool Based on Augmented Reality and Sensor-based Recognition” by Zhao *et al.*, and “Sensor-assisted Evaluation Framework for Mobile Cooling Devices Integrating Environmental Sensing and Multicriteria Decision-making” by Niu and Yang.
- (3) Sensor Applications: “Real-time Data Processing Optimization in Smart City Using Internet of Things and Sensor Network” by Hu *et al.*, and “Sustainable Forest Resource Management Using IoT Sensor Network” by Liuyang Zheng, and “Investigation on the Factors Affecting Internet Medical Service Utilization among Elderly Patients with Chronic Diseases: Use of a Chain Mediation Model” by Lai *et al.*, and “Sensor-integrated Multidimensional Evaluation of Specialty Development and Quality Development in an Academic Medical Center” by Huang *et al.*, and “Sensor-oriented Data-driven Fault Diagnosis for Parallel Robots: Sensing Mechanisms, Signal Characteristics, and Feature Representation” by Fang *et al.*, and “A Smart and Noncontact Infusion Monitoring and Alert System Based on ESP32-C3 with IoT Connectivity” by Chuang *et al.*

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