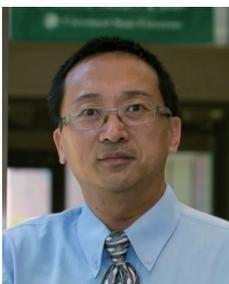


## SPECIAL ISSUE ON NOVEL SENSORS, MATERIALS, AND RELATED TECHNOLOGIES ON ARTIFICIAL INTELLIGENCE OF THINGS APPLICATIONS: PART 4-2

### 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 4-2 of this special issue, 14 excellent papers in four categories of sensors and materials fields have been selected.

(1) Physical/Mechanical Sensors: "Fabrication and Characterization of NiO-doped Ga<sub>2</sub>O<sub>3</sub> films and Applications in Deep-ultraviolet Photodetectors" by Kuo *et al.*, and "Finite Element Impact Analysis of Integrated Cranial-Brain-Cervical Model Developed Using Optical 3D

Scanning Sensors” by Tseng *et al.*, and “Handwriting Optimization System Using Pressure Sensor Array for Touch-type Digital Painting” by Zhu and Hu, and “Acoustic–Vibration Fusion with Sparse Representation for Intelligent Fault Detection in Home Appliances” by Zhao and Mao.

- (2) Materials: “Development of Heat Stamping Die Through Optimization of Parameters for Defect Prevention” by Chen *et al.*
- (3) Related Technologies: “Resource-efficient Medical Image Segmentation Based on Self-supervised Learning and Dynamic Multimodal Sensor Fusion” by Li and Kong, and “Bandwidth-aware Multimodal Sensor Data Prioritization for Multi-unmanned Surface Vehicle Tracking Using Dynamic Marine Attention Network” by Wen *et al.*
- (4) Sensor Applications: “Application of Advanced Sensor Technology in Simultaneous Localization and Mapping for Industrial Automation” by Li *et al.*, and “Multisource Sensing Data and AI Models for Online Commerce Analysis” by Wu and Hu, and “Sensor-driven AI Framework for Sustainable Agri-food Supply Chain: Policy Gradient Optimization with IoT and Twin Delayed Deep Deterministic Policy Gradient Algorithm” by Li, and “Real-time Dynamic Data-driven Wearable Devices in Sports Training” by Shan *et al.*, and “Construction of Learning Resources for International Chinese Language Education Based on Sensor Technology and Knowledge Graphs” by Fu *et al.*, and “AI-technological Pedagogical Content Knowledge Framework through Structural Equation Modeling and Wearable Sensor Indicators for English Language Educators” by Chu and Ma, and “An IoT Sensor-enabled Heritage Interpretation System: Empirical Validation through Servicescape–Stimulus–Organism–Response Structural Modeling” by Zhuang *et al.*

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