Special Issue on Novel Sensors, Materials, and Related Technologies on Artificial Intelligence of Things Applications. Part 5-2

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 5-2 of this special issue, 11 excellent papers in five categories of sensors and materials fields have been selected.

(1) Physical/Mechanical Sensors: “Design of a Planar Metamaterial Absorber Capable of Optical Sensing from 500 to 3160 nm” by Min *et al.*

(2) Bio_Chemical_Sensors: “Supercritical CO2-assisted Deposition of TiO2 Nanoparticles for High-performance Nonenzymatic Glucose Sensors” by Huang and Sun.

(3) Related Materials: “Integrated Sensor for Detecting Hydrogen Concentration as Proxy for Ethylene and Propylene Production Using Pt–Fe and Pt–Cu Catalysts” by Lee *et al.*

(4) Related Technologies: “Quality Assessment and Classification System of Lychee Using Deep Learning and IoT Technology” by Yao and Wang, and “Development of Intelligent Mechatronic Integration System for Silk Reeling Machine” by Chuang *et al.*, and “Health Assessment Model for Data Centers Using Environmental Sensor Networks and Uninterruptible Power Supply Telemetry” by Liu *et al.*, and “A Sensor-based Multi-modal Evaluation Framework for Optimizing Redesigned Interdisciplinary Human–Machine Interfaces by Webcam-based Eye-tracking in Intelligent Manufacturing” by Chen, and “Sensor-Integrated Heat Dissipation Design and Its Optimization for Routers with Thermal Load” by Chiu *et al.*, and “Design and Performance Evaluation of a Multisource-sensor-fusion-based Immersive Interactive Projection System” by Zhong *et al.*

(5) Sensor Applications: “Optimizing Autonomous Robot Control Algorithm: Deep Reinforcement Learning for Dynamic and Uncertain Environments” by Li *et al.*, and “Sensor-enabled Three-dimensional Presentation and Interaction Modeling for Mobile Augmented Reality Advertising: A Measurement and Structural Validation Approach” by Li *et al.*

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