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

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 2-2 of this special issue, 13 excellent papers in four categories of sensors and materials fields have been selected.

(1) Bio/Chemical Sensors: "Brain Wave Application in E-commerce Discipline" by Wei *et al.*

(2) Materials: "Effect of Nanoparticle Size on the Photovoltaic Performance of Sol–gel-derived

TiO$_2$ Thin-film Dye-sensitized Solar Cells" by Kao *et al.*, and "Comprehensive Study on the Effects of Neodymium Doping Concentration on the Structural, Morphological, and Output Properties of Flexible ZnO Nanogenerators" by Min *et al.*

(3) Related Technologies: "Comparative Mechanical Analysis Using Finite Element Model of Material Selection of Hoes" by Huang *et al.*, and "Transforming Rural Environmental Governance Using Machine Learning Based on Sensor Data for Sustainable Practices" by Li *et al.*, and "Artificial Intelligence Technology for Enhancing Learning Outcomes of Children with Disabilities" by Zhang and Cheng, and "Cyber-physical System-based Wide-area IoT for Illegal Forest Logging Monitoring and Alert System" by Liao *et al.*, and "A Time-based Secure Access Control Framework for Cloud Medical Sensor Information Systems" by Ho *et al.*, and "Enhanced Noise Reduction in Photoplethysmography Signals Using a Denoising Autoencoder" by Lai *et al.*, and "Gas Leak Detection in Industrial Air Compressors Using Vision Transformer with Multistage Transfer Learning" by Huang *et al.*, and "Improving Power Disaster Prevention Efficiency through Smart Sensors and Automated Monitoring Systems" by Hsuan-Chao Huang, and "Multiscale Residual Attention and Multitask Learning for Steady-state Visual Evoked Potential Brain–Computer Interfaces" by Chen *et al.*

(4) Sensor Applications: "Remote Assessment of Size, Ripeness, and Count of Fruits in Orchard Greenhouse" by Chiu *et al.*

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