Special Issue on Innovations of Sensor Applications and Related Technologies in IoT Part 4-3

Preface

In recent years, applications of novel sensors and related technologies in electronic and mechanical devices have become rapidly developing fields. The booming economic development in Asia, particularly in leading manufacturing industries such as automobiles, machinery, computers, communications, flat panel displays, semiconductors, and micro/nanoscale technologies, has attracted intense attention among universities, research institutions, and many industrial corporations. Manufacturing is the economic lifeline of a country and has been regarded as a labor intensive industry. To cut production costs, devices for the Internet of Things (IoT) have been widely developed. IoT systems can be 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 aim of attracting companies that manufacture high-value-added products in the fields of aerospace, automotive, IT molds, textiles, optoelectronics, watches, medical devices, automation, energy, and semiconductor-related parts and components to drive a country's economy. Therefore, the key to maintaining a competitive advantage in domestic manufacturing in the future is still to promote the development of novel manufacturing and precision-machinery-related technologies.

The scope of this Special Issue, "Innovations of Sensor Applications and Related Technologies in IoT," covers fundamental sensors and materials used in electronic, mechanical, and electrical engineering including their synthesis and integration with many elements; the design of electronic and optical devices; sensing technologies; the evaluation of various performance characteristics; and the exploration of their broad applications to industry, environmental control, materials analyses, and so forth. The part 4-3 of this special issue selects 14 excellent papers about four categories of sensors and materials fields:

(1) Physical Mechanical Sensors: "Technology for Sensing and Reducing Noise in Acoustic Emission Signals for Online Detection of Wear Condition of Transmission Gears in a Nuclear Power Plant" presented by Wu *et al.*, and "Assessment System of Permanent Displacement of Ground Surface Caused by Seismic Rupture due to Active Faults" presented by Liu *et*

al., and "Microwave Dielectric Properties of Ge-substituted $Nd(Ti_{0.5}Mo_{0.5})O_4$ Ceramics for Application in Slot Antenna Liquid Sensor" presented by Chen and Lin, and "Five-axis Machine Tool Backlash Error Detection System Using Photoelectric Sensor" presented by Hsieh *et al.*, and "Hardware-in-the-loop Simulation for Speed Control of Surface-mounted Permanent Magnet Synchronous Motor with Field-weakening Functionality" presented by Lin *et al.*, and "Temperature Optical Sensor Made of Recycled Waste Materials and Implementation of Machine Learning Method to Expand Its Measurement Range" presented by Ramirez-Zavala *et al.*

(2) Related Materials: "Investigation of Microstructure and Photoluminescence of Ce^{3+}/Eu^{3+} Codoped $KZnPO_4$ Phosphors" presented by Qi *et al.*

(3) Related Technologies: "Virtual Foundry Graphnet for Predicting Metal Sintering Deformation" presented by Chen *et al.*, and "Implementation of Interactive System with Millimeter Wave and Wavelet Transform" presented by Chen *et al.*, and "Sensor Network Based on Machine Learning in Tourist Area" presented by Wang *et al.*, and "Evaluation System of Green Smart City" presented by Hsu *et al.*, and "Generative Adversarial Network Applied to Electromagnetic Imaging of Buried Objects" presented by Chiu *et al.*, and "Design and Simulation of a Maintenance-friendly and Cost-effective Molten Aluminum Alloy Casting Mechanism" presented by Bakhtiar *et al.*

(4) Sensor Applications: "Designing Human-building Interfaces for Existing Buildings with Responsive Materials and Mobile Robots" presented by Khoo.

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