

SPECIAL ISSUE ON INNOVATIONS OF SENSOR APPLICATIONS AND RELATED TECHNOLOGIES IN IOT PART 3-2

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 3-2 of this special issue selects 10 excellent papers about three categories of sensors and materials fields:

- (1) Physical Mechanical Sensors: "Damage and Defect Identification in Cementitious Materials with Heat Generation by Applying Sonic-IR method" presented by K. Hashimoto *et al.*,

“Detecting Spin Hall Signals of Permalloys and Heavy Metals through the Inverse Spin Hall Effect” presented by Lai *et al.*, “Design of LED Lighting System with Improved Color Mixing Uniformity” presented by Hung *et al.*, and “Online Monitoring and Prediction Methodology of Lubricating Oil State in Gearbox of a Nuclear Power Plant Based on Measurement with Sensors” presented by Wu *et al.*

(2) Related Materials: “Employment of Finite Element Analysis Method to Analyze the Thermal Effects of Direct Energy Deposition on SUS316L” presented by Zheng *et al.*

(3) Related Technologies: “Optimization of University Scientific Research Performance Evaluation Management Based on Back-propagation Artificial Neural Network” presented by Ma and Chu, “Geometric-angle Optimization of Milling Cutter for Processing Stainless Steel by the Finite Element Method” presented by Yang *et al.*, “Vehicle Detection on Express Roads Using YOLOv7 with Taguchi Parameter Optimization Method” presented by Chen *et al.*, “Almost Finite-time Synchronization of Coronary Artery Systems via Adaptive Fractional-powered-integral-type Sliding Mode Control Method” presented by Hong *et al.*, and “Design of a Wave Electric Power Generation System with Maximum Output Power” presented by Zhang *et al.*

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Dr. Teen-Hang Meen

Distinguished Professor, Department of Electronic Engineering
National Formosa University, Taiwan

Dr. Wenbing Zhao

Professor, Department of Electrical Engineering and Computer Science
Cleveland State University, USA

Dr. Cheng-Fu Yang

Professor, Department of Chemical and Materials Engineering,
National University of Kaohsiung, Taiwan