

SPECIAL ISSUE ON APPLICATIONS OF NOVEL SENSORS AND RELATED TECHNOLOGIES FOR INTERNET OF THINGS: PART 2-2

PREFACE



In recent years, applications of novel sensing and related technologies to electronic and mechanical devices have become very popular fields. The booming economic development in Asia, particularly the leading manufacturing industries from automobile, machinery, computer, communication, consumer products, and flat-panel displays to semiconductor and micro/nano applications have attracted intense attention from universities, research institutions and many industrial corporations. Manufacturing is the economic lifeline of a country and has been regarded as a labor-intensive industry. In order to cut production costs, devices for the Internet of Things have been widely developed. The Internet of Things is composed of 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 aerospace, automotive, IT mold, textiles, optoelectronic, watches, medical device, automation, energy, and semiconductor-related parts and components fields. Therefore, the key to maintaining a competitive advantage in domestic manufacturing in the future is to continue to rely on the development of novel manufacturing and precision machinery-related technologies.

The scope of this Special Issue, entitled “Applications of Novel Sensors and Related Technologies for Internet of Things”, 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, evaluation of various performance characteristics, and exploration of their wide-ranging applications in areas such as industry, environmental control, and materials analyses. In part 2-2 of this special issue, 9 excellent papers in five categories of sensors and materials fields have been selected.

- (1) Physical/Mechanical Sensors: “Efficient Direction of Arrival Estimation Using Particle Swarm Optimization for Hybrid Analog and Digital Massive Multiple-input Multiple-output Receiving Array” by Chang *et al.*, and “Effects of Electrode Structures on the Sensing Characteristics of Capacitive Accelerometers” by Chen and Meng.
- (2) Bio/Chemical Sensors: “Biological Characteristics of Anaerobic Baffled Reactor in Operation” by Sun *et al.*, and “Impact of Preferential Flow in Ionic Rare Earth Macropores on Water and Salt Transport by Soil Sensors” by Zhang *et al.*

- (3) Materials: “Performance of Dye-sensitized Solar Cells Using Titanium Dioxide and Silver Nanowire Composite Film” by Hsu *et al.*
- (4) Related Technologies: “Parameters in Operating Rotary Engine with Hydrogen for Efficiency Improvement” by Leu *et al.*, and “AI-powered Personalized Online Drawing Assistant with Hand Skeleton Analysis” by Kao *et al.*
- (5) Sensor Applications: “A Scalable IoT-driven Smart Agriculture System: Ontology-based Inference and Automation for Hydroponic Farming” by Lin and Tu, and “Impact of Structural Changes in the Chip Carrier on the Heat Dissipation Performance of Power Transistors” by Chang *et al.*

The guest editors thank the authors for their contributions to this special issue and all the reviewers for their constructive comments. We are also grateful to the editorial staff for their time and efforts on the publication of this special issue of *Sensors and Materials*.

Dr. Teen-Hang Meen
Lifetime 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