

SPECIAL ISSUE ON APPLICATIONS OF NOVEL SENSORS AND RELATED TECHNOLOGIES FOR INTERNET OF THINGS: PART 4-2

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 4-2 of this special issue, 14 excellent papers in four categories of sensors and materials fields have been selected.

- (1) Physical/Mechanical Sensors: “Sensor-based Motion Analysis for Injury Assessment in Professional Pitchers” by Tseng *et al.*
- (2) Materials: “Effect of Binary Solvent System of Methyl Acetate and Chlorobenzene on Crystallization of Perovskite” by Chang *et al.*
- (3) Related Technologies: “Obstacle Avoidance and Navigation of Unmanned Ground Vehicles

Using a Type-2 Fuzzy Neural Controller Based on Improved Mantis Search Algorithm” by Lin *et al.*, and “Underwater Acoustic Cooperative Communication Network: A Stackelberg Game-based Power Control Method” by Luo and Wang, and “Education Quality Evaluation of Colleges and Universities Based on Advanced Technologies and Multimodal Artificial Intelligence Sensors in Colleges and Universities” by Ma *et al.*, and “Application of AI Deep Learning in Aircraft Shape Analysis and Validation for High-performance Numerical Wind Tunnel” by Huang *et al.*, and “Computer-vision-based Displacement Monitoring System for Long-distance and Long-term Measurement on a Slope” by Chen and Yang, and “Application of Fuzzy Hierarchical Analysis for Developing Near-field Communication Chip for Tracking Aromatherapy Products” by Wu *et al.*, and “Enhancing Driver Fatigue Monitoring: A Hybrid Human–Machine Intelligence Framework with Adaptive Real-time Feedback” by Zhu *et al.*, and “Light-weight Algorithm for Improving Smoke and Fire Detection Accuracy in Complex Environments” by Lin *et al.*, and “Integration of Real-time Carbon Accounting and Energy Management for Strategic Decarbonization in Electronics Manufacturing” by Mao *et al.*

- (4) Sensor Applications: “Robotics and Sensor Technology Education Using LEGO Mindstorms NXT” by Li *et al.*, and “Big Data and Novel Sensors to Enhance Effectiveness of Monetary Policy in Internet of Things Era” by Zhang *et al.*, and “Sensor Technology in Early Warning System for College Students’ Mental Health Risk” by Wang and Sheng.

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