Special Issue on Intelligent Sensing Control Analysis, Optimization, and Automation: Part 1

Preface

Advances in hardware development have made available low-cost and low-power miniature devices for use in smart sensing applications. The combination of these factors has improved the viability of utilizing a sensor network consisting of a large number of intelligent sensors, enabling the collection, processing, analysis, and dissemination of valuable information, such as vibration signals, displacement, temperature, and humidity gathered in various environments or machine equipment. Intelligent technologies in the research field of innovation in advanced system design, sensing control, optimization, and automation have made considerable progress in recent years, and the term "intelligent automation system" has now become popular in the field of mechatronic engineering and development of intelligent manufacturing.

With the advancement of smart materials, also called intelligent or responsive materials, one or more properties of such materials can be significantly changed in a controlled fashion by external stimuli, such as stress, moisture, electric or magnetic fields, light, or temperature. Smart materials are the basis of many applications, including sensors, actuators, and artificial muscles. They can also be applied to intelligent automation system monitoring and feedback optimization to increase efficiency or quality for industrial application. Driven by such motivation, the innovative design of smart materials combined with intelligent sensing control techniques is proposed not only in the area of engineering but also in new paradigms in smart science. This special issue includes the mathematical and physical theories of smart system analysis and optimization in physical, engineering, and biological studies, and their various applications. Prospective authors were invited to submit original papers to this special issue.

This special issue presents eight papers focusing on intelligent sensing technology, including advanced materials and manufacturing processes and advanced modeling and control technology in mechatronic and energy systems for precision engineering systems. This special issue also presents current innovative and intelligent sensing analyses and experiments. Lastly, I sincerely thank Ms. Misako Sakano, Editorial Department of MYU K.K., for her kind support in the publication of this issue.

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