EDITORIAL

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Guest Editor

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Although robotics has been studied for several decades, this research topic still plays a key role in various areas and receives increasing attention, which should be attributed to the fact that robotics is a basis that spans a variety of applications in different domains, including industry, education, entertainment, military, and medical/health care. Therefore, there are always novel and encouraging developments in the robotics community, making this research field more and more attracting. These emerging technologies are often presented in conferences related to robotics. In 2012, one of the leading conferences in the robotics community, the International Symposium on Robotics (ISR) was held in Taipei, Taiwan, where 250 papers from more than 20 different countries were presented. Among the papers presented, 40 papers were recommended to the International Journal of Automation and Smart Technology for possible publication after a rigorous selection by Dr. Han-Pang Huang, the Program Chair of ISR. After a further peer-review process, only 14 papers were accepted. The aim of this special issue of the International Journal of Automation and Smart Technology is to provide a collection of the best papers from ISR2012, and share the emerging technologies related to intelligent robotics proposed in these collected and accepted papers. This special issue is divided into two parts. The first part includes seven papers and has been published in December, 2012. The remaining seven papers are included in the second part published in March, 2013. An introduction to the second part of this special issue is provided below.

The paper entitled **“The Preliminary Development of an Automated Optical Inspection System for Quality Control of Circular Saw Inserts”** co-authored by Wen-Tung Chang, Shui-Fa Chuang, Cheng-Yu Li, Fang-Jung Shiou, and Geo-Ry Tang, proposed the preliminary development of an automated optical inspection (AOI) system for quality control of circular saw inserts. The paper entitled **“Multi-sensor Fusion Based on Camera and Laser Range Finder for Mobile Manipulations”** co-authored by Yong Jiang and Hong-Guang Wang proposed a novel multi-sensor fusion method based on a camera and a laser range finder (LRF) for mobile manipulations, by which the autonomous identification and location of target object are achieved. Chin-Yuan Tseng, Yu-Lun Huang, and Jwu-Sheng Hu proposed the paper entitled **“ESAIR: A Behavior-Based Robotic Software Architecture on Multi-Core Processor Platforms”**, which introduces an Embedded Software Architecture for Intelligent Robot systems (ESAIR) that addresses the issues of parallel thread executions on multi-core processor platforms. The ESAIR is implemented on an autonomous robot, named AVATAR. With the support of ESAIR, AVATAR can integrate a comprehensive set of behaviors and peripherals with better resource utilization. He-Sheng Wang proposed the paper entitled **“Sequential Quadratic Method for GPS NLOS Positioning in Urban Canyon Environments”**, where a new position-determination estimator based on the sequential quadratic programming (SQP) that is able to estimate and eliminate the path-delay error caused by the indirect transmission of the GPS signal is presented.

The paper entitled **“Real-Time Analysis of Beats in Music for Entertainment Robots”** co-authored by Shu Huang, Erwin Aertbeliën, Herman Bruyninckx, and Hendrik Van Brussel proposed a method which can extract meaningful geometric information from sensory data. A combined machine learning approach, which consists of decision tree and support vector machine, is also proposed for behavior-based task learning. The paper entitled **“Portable 3D laser-camera calibration system with color fusion for SLAM”** co-authored by Javier Navarrete, Diego Viejo, and Miguel Cazorla presented a portable calibration system to calibrate any traditional camera with a 3D laser in order to assign color information to the 3D points obtained. In order to get a 3D colored map which can be used in different tasks, their calibration system is used and tested in a 3D mapping system,

including Simultaneous Location and Mapping (SLAM). Yi-Hung Liu, Han-Pang Huang, Tzu-Hao Huang, Zhi-Hao Kang, and Jyh-Tong Teng proposed the paper entitled **“Controlling a Rehabilitation Robot with Brain-Machine Interface: An approach based on Independent Component Analysis and Multiple Kernel Learning”**, where a brain-machine interface (BMI) based on the P300 event-related potential (ERP), called the Brain Controlled Rehabilitation System (BCRS), was developed to detect patient intentions and control a rehabilitation robot. An Independent Component Analysis – Multiple Kernel Learning (ICA-MKL) is also proposed used to directly extract useful features from brain waves, i.e., EEG signals, and build the classification mode for BCRS.

Yi-Hung Liu received his M.S. in engineering science and ocean engineering and his Ph.D. degree in mechanical engineering, both from National Taiwan University, Taiwan, in 1996 and 2003, respectively. In 2003, he joined the faculty of Chung Yuan Christian University, Taiwan, where he is currently Associate Professor of Mechanical Engineering. His research interests include machine learning, machine vision, brain-computer/robot interfaces, neuroprostheses, and intelligent system diagnosis.

Dr. Liu is a member of the IEEE and CIAE. He currently serves as Associate Editor of the International Journal of Automation and Smart Technology (AUSMT), and Guest Editor of the Journal of Neuroscience and Neuroengineering (JNSNE) issued by American Science Publishers. He is the current Co-chair of the Technical Committee on Medical Mechatronics of IEEE's SMC society. He has published 60 papers in journal and conference proceedings. He was the recipient of the 2006 Best Paper Award from the Chinese Institute of Industrial Engineers, the recipient of the Annual Best Paper Award from the 2009 Automatic Optical Inspection Forum and Competition, and the recipient of the Best Paper Award from the 2nd International Conference on Mechatronics and Applied Mechanics in 2012. He was named in Marquis' Who's Who in Asia 2007, and Who's Who in the World 2008, 2009, and 2010.