



EDITORIAL

SPECIAL ISSUE: Intelligent Robotics (1/2)

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 robotic 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 15 papers were accepted by this journal. 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 ISR 2012, and share the emerging technologies related to intelligent robotics proposed in these collected and accepted papers. This special issue is divided into two parts, which are published in December, 2012, and March, 2013, respectively. There are seven

papers in the first part, while the rest will be published in the second part. An overview of the first part of this special issue is provided below.

The paper entitled “**An Embedded System for Tracking Human Motion and Humanoid Interfaces**” co-authored by Ming-June Tsai, Hung-Wen Lee, Trinh-Ngoc Chau, and Chia-Hong Chao, proposed a human motion tracking system and constructed a motion replication interface for a humanoid robot. In their proposed motion tracking system, a complex programmable logic device is built in a central unit (CCU) to generate synchronous signals. In addition, the same CCU is used to generate PWM signals to drive the humanoid robot.

The paper entitled “**Automatic 3-D Optical Detection on Orientation of Randomly Oriented Industrial Parts for Rapid Robotic Manipulation**” co-authored by Liang-Chia Chen, Manh-Trung Le, and Xuan-Loc Nguyen proposed a novel method employing a developed 3-D optical imaging and processing algorithm for accurate classification of an object’s surface characteristics in robot pick and place manipulation.


Wen-Chung Chang and Chia-Hung Wu proposed the paper entitled “**Hand-Eye Coordination for Robotic Assembly Tasks**”, which aims at addressing issues related to the design and implementation of robotic assembly tasks. In particular, the application of real-time visual sensing-based automatic assembly systems with for the



back shells of cellular phones is considered is this paper. Zen-Chung Wang, Ching-Chih Tsai and Ming-Chen Chien proposed the paper entitled “**Design of an Intelligent Soldier Combat Training System**”, where an intelligent soldier combat training (ISCT) system using X-Box Kinect and augmented virtual reality (AVR) was developed. This system improves soldier training performance through AVR-based simulation combat fields.

The paper entitled “**Real-Time Analysis of Beats in Music for Entertainment Robots**” co-authored by Yue-Der Lin, Ting-Tsao Wu, Yu-Ren Chen, Yen-Ting Lin, Wen-Hsiu Chen, Shih-Fan Wang, and Jingham Chakhap proposed a real-time algorithm to detect the primary information of the music needed for the actions of entertainment robots. This algorithm is computationally cheap and thus can satisfy the requirement of real-time processing by a digital signal controller.

The paper entitled “**Advanced Driving Assistance Systems for an Electric Vehicle**” co-authored by Pau Muñoz-Benavent, Leopoldo Armesto, Vicent Girbés, J. Ernesto Solanes, Juan F. Dols, Adolfo Muñoz, and Josep Tornero presented the automation of a Neighborhood Electric Vehicle (NEV) and the embedded distributed architecture for implementing an Advanced Driving Assistance System (ADAS) with haptic, visual, and audio feedback in order to improve safety. Collision avoidance and motion planning are also embodied in this system.

Takashi Nammoto and Kazuhiro Kosuge proposed an analytical solution for the inverse kinematics of a redundant manipulator with seven degrees of freedom and an offset rotation axis in the paper entitled “**An Analytical Solution for a Redundant Manipulator with Seven Degrees of Freedom**”, where a model for the redundant manipulator is also provided. 

Yi-Hung Liu received the B.S. degree in naval architecture and marine engineering from National Cheng Kung University, Taiwan, in 1994, and the M.S. degree in engineering science and ocean engineering and Ph.D. degree in mechanical engineering, both from National Taiwan University, Taiwan, in 1996 and 2003, respectively. In August 1996-July 1997, he was a teaching assistant in the Department of Engineering Science and Ocean Engineering, National Taiwan University. Since 2003, he has been with Chung Yuan Christian University, Taiwan, where he is currently an Associate Professor with the Department of Mechanical Engineering. His research interests are machine learning, machine vision, brain-computer/robot interface, neuroprosthesis, and intelligent system diagnosis. Dr. Liu is a member of the IEEE and CIAE (Chinese Institute of Automation Engineers). He is an associate editor of the International Journal of Automation and Smart Technology (AUSMT), and the Journal of Neuroscience and Neuroengineering (JNSNE) published by American Science Publishers. He has served as the guest editor of the special issue “Neuroprosthesis” of the JNSNE, and served as co-chair of the Technical Committee on Medical Mechatronics, IEEE SMC society. He was the author/co-author of more than 50 journal and conference papers. According to the Thomson Reuters, his paper entitled “Face Recognition Using Total-Margin based Adaptive Fuzzy Support Vector Machines” published in IEEE Transactions on Neural Networks in 2007, was the most cited article (Top 1 article) among the 878 papers in the field of face recognition. He was the recipient of the 2006 Best Paper Award from the Chinese Institute of Industrial Engineers, and the recipient of the Annual Best Paper Award from the 2009 Automatic Optical Inspection Forum and Competition held in Taiwan. He was named in Marquis’ Who’s Who in Asia 2007, and Who’s Who in the World 2008, 2009, and 2010.

