



## EDITORIAL

# Advanced Robotics and Control

Guest Editor

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DOI: [10.5875/ausmt.v5i1.863](https://doi.org/10.5875/ausmt.v5i1.863)

(Published online 1 March 2015)

Robotics has recently received significant attention due to its wide application in domains such as factory automation, autonomous vehicles, elderly care, surveillance and rescue, etc. Since a robot is an inherently complex system, its functionality requires the development of not only individual components but also of the level of integration. This special issue reports on six cutting-edge developments in various spheres of robotics and control.

The paper entitled “**Position Control of a Serial Manipulator Using Fuzzy-PID Controllers**” co-authored by Yong-Lin Kuo and Shih-Min Liu presents a control strategy that fuses traditional PID feedback and fuzzy feedback, with simulation and experimental results validating that the proposed Fuzzy-PID controller improves steady-state performance. The paper entitled “**Exposure-based Weighted Dynamic Histogram Equalization for Image Contrast Enhancement**” co-authored by Yung-Yao Chen and Shin-Anne Chen reports on a novel histogram equalization method that extends the exposure-based sub-image histogram equalization in order to achieve better performance in terms of contrast enhancement, brightness preservation, and entropy preservation. The paper entitled “**2D-Span Resampling of Bi-RRT in Dynamic Path Planning**” authored by Hsien-I Lin and Cheng-Sun Yang describes a method by which to prune and smooth bi-directional random trees (Bi-BRT) so as to improve

both the selection of path route and the computational time of path planning. The paper entitled “**Tracking and Following Algorithms of Mobile Robots for Service Activities in Dynamic Environments**” co-authored by Feng-Li Lian, Chin-Lung Chen, and Chih-Chung Chou reports on an algorithm that can plan the trajectory of the follower robot so as to maximize the visibility of the target while following. The paper entitled “**Hierarchical Coordination for Multi-Robot Systems with Region-Based Tracking Control**” co-authored by Chao-Wei Lin, Luis A. Sanchez-Porras, and Yen-Chen Liu describes a control framework for the hierarchical coordination of multi-robot systems using lead-follower and region-based approaches. The paper entitled “**Long-term RFID SLAM using Short-Range Sparse Tags**” co-authored by Jiun-Fu Chen and Chieh-Chih Wang reports on a method that utilizes an extended Kalman filter with sparse RFID inputs to solve the overconfidence issue in traditional simultaneous localization and mapping (SLAM).

**Pei-Chun Lin** is an Associate Professor in the Department of Mechanical Engineering at National Taiwan University (NTU), Taipei, Taiwan. He received B.S. and M.S. degrees in mechanical engineering from NTU in 1996 and 1998, respectively, as well as an M.S. degree in electrical engineering and computer science and a Ph.D. in mechanical engineering from the University of Michigan, Ann Arbor, U.S.A. in 2005. He then worked as a postdoctoral research fellow in the Department of Materials Science and Engineering at the University of Pennsylvania before moving to NTU in 2007. He is the director of the Bio-inspired Robotics Laboratory (BioRoLa) at NTU. His research interests include bio-inspired robotics, mechanical design, sensor design/fusion, control, locomotion, and polymer applications in robotics. He is a member of IEEE, ASME, CSME (Chinese Society of Mechanical Engineers), CIAE (Chinese Institute of Automation Engineers), and RST (Robotics Society of Taiwan). He was the recipient of the 2012 Ta-You Wu Memorial Award from the National Science Council, and the 2013 Distinguished Teaching Award from National Taiwan University.

