Editorial

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Biographical notes: Maki K. Habib is a Professor at the Mechanical Engineering Department, School of Sciences and Engineering, American University in Cairo, Egypt. His main area of research are focusing on autonomous and service robots, human adaptive and friendly mechatronics, autonomous navigation, robotics and humanitarian demining, robotics and industrial automation, telecooperation, distributed teleoperation and collaborative control, modern and intelligent control, biomedical robots, wireless sensor networks and ambient intelligence, biomimetic robots. He edits seven books, published more than 210 papers in internationally recognised books, journals and conferences beside many technical reports and industrial projects.

This special issue of the *International Journal of Mechatronics and Manufacturing Systems* (*IJMMS*) on 'Advances in robotics and mechatronics' includes six research papers focusing on new development in the field of robotics and mechatronics systems. The first paper titled: 'Dynamic step traverse of a two-wheeled mobile robot' authored by Yap and Hashimoto. The paper presents a new approach to enable two-wheeled mobile robot to traverse non-continuous step-terrain dynamically while maintaining balance. The second paper titled: 'Genetic algorithms with variable search space function for fine gain tuning of model-based robotic servo controller' by Otsuka et al. In this paper, genetic algorithms with a variable search space function are proposed for fine gain tuning of a resolved acceleration controller which is one of model-based robotic servo controllers. The effectiveness of the proposed method was proved through a trajectory following control simulation using the dynamic model of PUMA560 manipulator. The third paper titled: 'A forming algorithm and its position estimation for triangle-based robot formation' by Kato et al. The paper introduces an imaginary equilateral triangle algorithm to form equilateral triangle as a basic formation in the formation control of multi-robots, and a method for achieving movements in formation. The fourth paper titled: 'Multiple mobile robots system with network-based subsumption architecture' by Nagata et al. In this paper, multiple mobile robots system has been proposed and implemented to enable students pursuing engineering studies in the field to experimentally learn the basic concept of subsumption control architecture that reflects a typical behaviour-based artificial intelligence. The fifth paper titled: 'Design and testing of a high frequency air-cored resonance transformer' by Gupta et al. This paper focuses on the step-by-step design of a high frequency air-cored resonance transformer

commonly called Tesla coil. Finally, the sixth paper titled: 'Formation control of multiple mobile robots utilising synchronisation approach' by Sanhoury et al. The paper proposes a synchronous control rule for multiple mobile robot trajectories tracking while maintaining time varying formation.

I hope that the contributed papers to this special issue will provide excellent reading experience to the readers of this journal besides offering substantial research content.

The guest editor wishes to acknowledge the support and encouragement provided by the Editor-in-Chief Prof. T. Özel, as well as expressing his sincere gratitude to all the authors for contributing their recent research work for this special issue. Last, but not the least, the guest editor would like to thank all the reviewers of this special issue for sparing their time and efforts in reviewing manuscripts promptly amidst their busy schedules.