

Guest Editorial: Focused Section on Inaugural Edition of TMECH/AIM Emerging Topics

I. INTRODUCTION

SINCE the official registration of the word “Mechatronics” as a trademark by Yaskawa Electric Corporation in 1971, explosive growth has been observed in mechatronics research and product development activities. Nowadays, mechatronics and mechatronic design methodologies play increasingly important roles in computer, communication, control, and consumer-product (4C) technologies. As such, it is fair to agree that mechatronics technology has profoundly affected almost all aspects of human life, particularly, of engineering realities ranging from rehabilitation devices to ground and underwater robots, and from unmanned aerial vehicles to intelligent manufacturing facilities, constituting a rapidly progressing frontline. For the last two decades, IEEE/ASME TRANSACTIONS ON MECHATRONICS (TMECH) as the top-quality journal and IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM) as the flagship conference have contributed remarkably to the motivation and inspiration of a large number of researchers in mechatronics, which evolves into a vibrant research field today. The creation of the new avenue of TMECH/AIM concurrent submission marks another important milestone in both TMECH and AIM histories. For the first time, the archival TMECH publication is bridged together with the AIM presentation to provide an efficient gateway for researchers to report and discuss their novel and significant breakthroughs in emerging topics while allowing the mechatronics community to rapidly access the state of the art of the field. In the first implementation of the TMECH/AIM concurrent submission, all accepted papers are collectively published in this Focused Section on Inaugural Edition of TMECH/AIM Emerging Topics and also presented at IEEE/ASME AIM 2020.

II. HIGHLIGHT OF REVIEW PROCESS

It is not an exaggeration to claim that the inaugural TMECH/AIM concurrent submission received an overwhelming response from the mechatronics community. Indeed, a total of 171 submissions were received by the deadline of January 8, 2020, on a broad range of mechatronics topics. With such a large number of submissions, significant challenges were presented to the execution of the high-quality review process within the stringent timeline of less than four months as required. Eventually, two rounds of rigorous review processes were completed by a

dedicated editorial board consisting of 23 Guest Editors with the support of more than 300 peer reviewers, strictly following the quality standard of TMECH. All Guest Editors are experienced and well-established experts in mechatronics, who are serving currently or served in the editorial board of TMECH and/or other relevant reputable journals such as IEEE TRANSACTIONS ON ROBOTICS. A total of 41 papers were finally accepted for joint publication in this Focused Section and presentation at AIM 2020 held virtually in July 2020. The topics involved in these 41 papers represent broad facets of mechatronics: novel sensors and actuators; medical robotics and rehabilitation devices; soft robotics; bioinspired robotic designs; robotic tactile systems; growing robots; service robots; data-driven and learning methods in robotics; motion planning and control; control of underwater, ground, marine, aerial vehicles, and automotive systems as well.

It is extremely encouraging to see the enormous volunteering support for this TMECH/AIM concurrent submission initiative from the mechatronic community.

III. ACKNOWLEDGMENT

Many people have contributed to the success of the inaugural TMECH/AIM concurrent submission. The Lead Guest Editors wish to take this opportunity to extend the first sincere gratitude to all authors of the 171 submissions for their contributions and to the 23 Guest Editors as well as all peer reviewers for their invaluable time and efforts to ensure the quality of the review process. It is indeed a commendable and collective accomplishment achieved during such a difficult period of time with the worldwide outbreak of the COVID-19 pandemic. We wish to thank Prof. I.-M. Chen, the Editor-in-Chief of TMECH, for his strong leadership, vision, and timely support delivered throughout the process. We would also like to thank Prof. G. Chiu, the past Editor-in-Chief of TMECH, for his strong support and leadership at the early stage of the initiative. It is worth mentioning that the following members of the current editorial board of TMECH provided valuable help: Prof. G. Alici, Prof. S. Foong, Prof. H. Gao, Prof. F. Janabi-Sharifi, Prof. J. C. Koo, Prof. Y. Li, Prof. Z. Liu, Prof. J. Shan, Prof. J. She, Prof. Y. Shi, Prof. T. Singh, Prof. H. Wang, Prof. C. Xiong, Prof. C. Zhang, Prof. X. Zhang, and Prof. Q. Zou. Our thanks also go to Prof. J. Yi, the General Chair of AIM 2020, for his tremendous coordination and cooperative work in seamless transition from TMECH to AIM 2020, with the strong support and help from

Prof. H. Fujimoto and Prof. T. Shimono who led the Conference Editorial Board for AIM 2020 as the Chair and the Secretary. As we are here to celebrate the publication of this Focused Section on Inaugural Edition of TMECH/AIM Emerging Topics, our last but certainly not least thanks go to Prof. K.-M. Lee, the former Editor-in-Chief of TMECH, for initiating the concurrent submission idea and for promoting the idea persistently such that it eventually becomes a reality.

Finally, as a new publication avenue, the Focused Section on TMECH/AIM Emerging Topics opens the door for effective and timely dissemination of novel research results and technology breakthroughs, which we strongly believe will greatly benefit the mechatronics community. It is then our true hope that this initiative would continue to gain momentum and evolve into an attractive niche for both TMECH and AIM in the future.

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