

Development of Novel, Robust, & Intelligent Controllers for Advanced Mechatronics Systems

Abstract

Advanced autonomous mechatronics systems have not only become one of the lead focal points of industries where automation is in high demand (such as manufacturing and automotive), but they have also found their way in other key and critical applications including exploration, environmental monitoring, search and rescue, data collection, etc. With the advent of leading-technologies across all industries, the application of these innovative systems will continue to grow - along with the need to provide robust and intelligent control solutions to further enhance the utility of these systems. Due to the rise in the complexities of the environments these advanced mechatronics systems required to operate at, developing innovative, effective, and novel robust control algorithms for such systems has become one of the most challenging and rewarding research.

This talk presents the development of novel and leading-edge advanced robust controllers for some frontier mechatronics systems such as: modular and reconfigurable robots, autonomous robots/vehicles, and soft robots. For each of the classes, the recent developments and achievements made by Dr. Biglarbegian and his research group at the Autonomous & Intelligent Control for Vehicles (AICV) lab are presented. This talk concludes with a brief review on some of AICV's recent results, ongoing work, and future directions.

Biography

Mohammad Biglarbegian, Ph.D., P.Eng.

Dr. Mohammad Biglarbegian is currently an associate professor with the School of Engineering, University of Guelph and a senior member of IEEE. He is the director of the Autonomous & Intelligent Control for Vehicles (AICV) research laboratory where he and his team conduct advanced research in developing novel control algorithms for different advanced mechatronics systems. Dr. Biglarbegian is currently supervising several graduate students and undergraduate students in his research lab. His research has been supported by several agencies and industrial partners and he has successfully made national and international collaborations. He is the author/co-author of 84 journal and conference papers, a book chapter, in addition to his contribution as a co-author of a textbook. He has won several prestigious scholarships and awards. He is the recipient of the University of Guelph Research Excellence Award in 2018. His areas of research are focused on developing novel robust control and optimization algorithms for advanced mechatronics systems.