ICIST 2023 Invited Session Proposal

Title: Control and Optimization of Autonomous Systems Based on Advanced Intelligent Algorithms

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With the development of artificial intelligence and related control and optimization theories, the application of autonomous systems in various industries is increasing. The significant ability of autonomous systems is construct agents' understanding of the world, as well as they can make key decisions and corresponding controls or cooperation autonomously through these understandings. They have great potential in solving complex engineering problems.

The aim of this invited session is to provide an opportunity for researchers to exchange their latest theoretical and technological achievements in control and optimization of autonomous systems based on advanced intelligent algorithms. All the submissions are expected to have original ideas and novel contributions.Potential topics for submissions include but are not limited to:

- **Advanced intelligence algorithm theories in autonomous systems;**

Including neural network based algorithms theories, reinforcement learning algorithms theories, supervised learning algorithms theories, etc. in autonomous systems.

- **Control and planning methods of autonomous systems;**

Including path planning methods, motion control methods, or other relevant dynamic programming and heuristic optimization methods of autonomous systems.

- **Optimization of multi-agent system based on intelligent algorithms;**

Including distributed decision-making, cooperation and communication of multi-agent system, or other distributed autonomous system control and optimization technologies.

- **Other autonomous system applications based on intelligent algorithms.**

Including autonomous driving, robotics technology, smart home, autonomous healthcare, etc.

Brief biographical information on the organizers:

Qihe Shan received the Ph.D. degree in control theory and control engineering from Northeastern University, Shenyang, China, in 2017. He is currently an Associate Professor with Dalian Maritime University. His current research interests include consensus control and strict containment control of multi-agent systems under complicated noise environment, distributed optimization theory, and their applications in the field of intelligent ship.

Fei Teng received the Ph.D. degree in control theory and control engineering from Northeastern University, Shenyang, China, in 2019. She is currently a lecturer with Dalian Maritime University. Her current research interests include distributed optimization theory, distributed cooperative control, and their applications in the field of complex energy systems.

Zuo Yi received Ph.D. degree in School of Information Science of Nagoya University in 2012. He was a Postdoctoral Research Fellow in Kansai University from 2012 to 2014, and was a research Assistant Professor in Nagoya University from 2014-2018. Currently, he is a full-time Professor of Navigation College and Director of Collaborative Innovation Center of Maritime Big Data and Shipping Artificial General Intelligence in Dalian Maritime University. His research focuses on Machine Learning and Data Science also including Evolutionary Computation.

Tieshan Li (Senior Member, IEEE) received the Ph.D. degree in vehicle operation engineering from Dalian Maritime University, in 2005. From 2007 to 2015, he has held positions, such as a Postdoctoral Researcher/Senior Research Associate/Visiting Scholar with Shanghai Jiao Tong University, Shanghai, China; the City University of Hong Kong, Hong Kong; and the University of Macau, Macau, China. He is currently a Tenured Professor with the University of Electronic Science and Technology of China. His research interests include intelligent learning and control for nonlinear systems, and multi-agent systems and their applications to unmanned vehicles.