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Special Session on

"Research and Application of Non-smooth Control"

Organized by

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Call for Papers

Theme: In recent years, the analysis and synthesis of non-smooth control systems have become a significant research point in the field of nonlinear control. This direction has obtained increasing attention due to the distinctive characteristics of non-smooth control, which includes both theoretical and practical level. Theoretical considerations focus on the existence of inherently nonlinear systems that cannot be stabilized through smooth control methods but can be effectively stabilized through non-smooth control strategies. From a practical standpoint, non-smooth control exhibits noteworthy feature in closed-loop systems with finite-time convergence. Such systems often have advantages like accelerated convergence and enhanced disturbance rejection capabilities. These dynamic behaviours, associated with finite-time convergence, cannot be achieved through smooth control but are achievable through non-smooth control. While more and more results have been made in non-smooth control theory research, several open questions persist. These include challenges related to non-smooth constraint control problems, non-smooth output feedback control problems, and non-smooth control for multivariable system, time-delay system and sampled-data systems, etc. Moreover, the application of non-smooth control in practical systems, particularly in robot system studies, remains relatively limited. In the field of artificial intelligence, how to combine non-smooth control with AI algorithm is also a meaningful research direction. In this background, the purpose of this invited session is to establish a platform for researchers and practitioners to share their latest findings, thereby contributing to the advancement of non-smooth control systems.

Accepted papers will be published in an IEEE proceedings volume and will be also submitted for the International Publication in *IEEE xplore*

Topics of interest include, but are not limited to:

Non-smooth feedback control and optimizing

Non-smooth sampling control and event trigger

Non-smooth state estimation and disturbance observer

Non-smooth cooperative control and swarm intelligence

Non-smooth control of high-order nonlinear systems

Non-smooth control of robotic system

Applications of non-smooth control

Non-smooth control combined with AI

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NO.

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Haibo Du (Senior Member, IEEE) received the Ph.D. degree in automatic control from Southeast University, Nanjing, China, in 2012.

He is currently a Professor with the School of Electrical Engineering and Automation, Hefei University of Technology, Hefei, China. He held several visiting positions in USA, Australia, and Hong Kong. His research interests include nonlinear control theory with applications to multiagent systems, spacecraft, and power electronics.

Prof. Du was a recipient of the Natural Science Award (Second Class) of the Ministry of Education of China in 2014 and the Natural Science Award (Second Class) of Anhui Province in 2020. He is one of the Elsevier Scopus Most Cited Chinese Researchers (Control and Systems Engineering) all over the world in 2020. He currently serves as a Guest Editor for the Asian Journal of Control and International Journal of Advanced Robotic Systems and other editorial board member.

Junxiao Wang (Senior Member, IEEE) received his B.S. in automation and M.S. degrees in control theory and control engineering from School of In formation Engineering, Henan University of Science and Technology (HAUST), Luoyang, China in 2008 and 2011, respectively, and the Ph.D. degree in con trol theory and control engineering from School of Automation, Southeast University (SEU), Nanjing, China, in 2017.

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Shihua Li (Fellow, IEEE) received the B.S., M.S., and Ph.D. degrees in automatic control from Southeast University, Nanjing, China, in 1995, 1998, and 2001, respectively.

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