

Title: Fixed-Time and Prescribed-Time Cooperative Control of Multi-Agent Systems

Invited Speaker:

Distinguished Professor Qing-Long Han, IEEE Fellow, IFAC Fellow, IEAust Fellow, CAA Fellow
Member of the Academia Europaea (The Academy of Europe)
Pro Vice-Chancellor (Research Quality), Swinburne University of Technology, Australia

Abstract: Fixed-time cooperative control of multi-agent systems has received considerable attention since it can provide an estimated bound of settling time, which does not depend on initial conditions. Compared with asymptotic cooperative control algorithms, fixed-time cooperative control algorithms can provide better closed-loop performance and disturbance rejection properties. In this keynote talk, fundamental concepts of fixed-time stability are first introduced, based on which some typical fixed-time consensus results are presented. Then, shortcomings for fixed-time consensus controllers are discussed, shedding light on the necessity of designing prescribed-time controllers. Hence, prescribed-time consensus control including practical prescribed-time consensus control is further explored. Following that, an application of prescribed-time consensus for smart grids is provided. Finally, several challenging issues in prescribed-time consensus control are discussed for future research.

Short Bio of Distinguished Professor



Professor Han is Pro Vice-Chancellor (Research Quality) and a Distinguished Professor at Swinburne University of Technology, Melbourne, Australia. He held various academic and management positions at Griffith University and Central Queensland University, Australia.

Professor Han was awarded The 2021 Norbert Wiener Award (the Highest Award in systems science and engineering, and cybernetics), The 2021 M. A. Sargent Medal (the Highest Award of the Electrical College Board of Engineers Australia), The IEEE Systems, Man, and Cybernetics Society Andrew P. Sage Best Transactions Paper Award in 2022, 2020, and 2019, respectively, The IEEE/CAA Journal of Automatica Sinica Norbert Wiener Review Award in 2021, and The IEEE Transactions on Industrial Informatics Outstanding Paper Award in 2020.

Professor Han is a Member of the Academia Europaea (The Academy of Europe). He is a Fellow of The Institute of Electrical and Electronics Engineers (FIEEE), a Fellow of The International Federation of Automatic Control (FIFAC), a Fellow of The Institution of Engineers Australia (FIEAust), and a Fellow of The Chinese Association of Automation (FCAA). He is a Highly Cited Researcher in both Engineering and Computer Science (Clarivate Analytics). He has served as an AdCom Member of IEEE Industrial Electronics Society (IES), a Member of IEEE IES Fellows Committee, a Member of IEEE IES Publications Committee, and Chair of IEEE IES Technical Committee on Networked Control Systems. Currently, he is the Editor-in-Chief of IEEE/CAA Journal of Automatica Sinica, the Co-Editor-in-Chief of IEEE Transactions on Industrial Informatics, and the Co-Editor of Australian Journal of Electrical and Electronic Engineering.