

Distributed Cooperative Anti-disturbance Control of Multi-agent Systems with Applications in Robotic Systems

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Abstract

This talk reviews some main results and recent progress in distributed cooperative anti-disturbance control (DCADC) of multi-agent systems. Compared with anti-disturbance control in single systems, DCADC is more challenging because of the existence of coupling in multi-agent systems and the aim is to design distributed cooperative control based on the local information of each agent. This paper is concerned with some kinds of DCADC methods, such as distributed cooperative variable structure control, distributed cooperative sliding mode control, distributed cooperative disturbance-observer-based control, and distributed cooperative output regulation control approaches. Some future research topics regarding DCADC methods are also pointed out.

About the speaker...



Wenwu Yu received the B.Sc. degree in information and computing science and M.Sc. degree in applied mathematics from the Department of Mathematics, Southeast University, Nanjing, China, in 2004 and 2007, respectively, and the Ph.D. degree from the Department of Electronic Engineering, City University of Hong Kong, Hong Kong, China, in 2010. Currently, he is the Founding Director of Laboratory of Cooperative Control of Complex Systems and the Deputy Associate Director of Jiangsu Provincial Key Laboratory of Networked Collective Intelligence, an Associate Director in the Research Center for Complex Systems and Network Sciences, an Associate Dean in the School of Mathematics, and a Full Professor with the Young Endowed Chair Honor in School of Mathematics, School of Automation, and School of Cybersecurity at the Southeast University, China.

Dr. Yu held several visiting positions in Australia, China, Germany, Italy, the Netherlands, and the USA. His research interests include multi-agent systems, complex networks and systems, disturbance control, distributed optimization, neural networks, game theory, cyberspace security, smart grids, intelligent transportation systems. He was listed by Thomson Reuters Highly Cited Researchers in Engineering in 2014 -2017. He publishes about 100 SCI journal papers with more than ten thousand citations. Moreover, he was awarded a National Natural Science Fund for Excellent Young Scholars in 2013, the National Ten Thousand Talent Program for Young Top-notch Talents in 2014, and the Cheung Kong Scholars Programme of China for Young Scholars in 2016. Dr. Yu is also the recipient of the Second Prize of State Natural Science Award of China in 2016.