上海交通大学自动化系
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Our Recent Research on Cooperative Control of Multi-Agent Systems

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摘要:

This talk consists of two parts. The first part presents an overview of our recent research on cooperative control of multi-agent systems, including event-triggered cooperative control, coverage control and entrapping control, cooperative control under communication delays, cooperative adaptive control with unknown agent dynamics, and cooperative control under DoS attacks. The second part presents a particular work on cooperative control of nonlinear multi-agent systems under DoS attacks. A novel distributed control scheme consisting of a resilient distributed observer and a distributed adaptive controller is proposed. Specifically, a novel resilient distributed observer in the form of an upper triangular chain of first-order low pass filters is designed to estimate the exosystem state based on a composite output observability condition. Then, a distributed adaptive controller is designed. It is shown that the resilient cooperative output regulation problem for the concerned class of uncertain nonlinear MASs can be solved by the proposed control scheme. A simulation example is finally provided to show the effectiveness of the proposed control scheme.

简介:

Gang Feng received the B.Eng and M.Eng. Degrees in Automatic Control from Nanjing Aeronautical Institute, China in 1982 and in 1984 respectively, and the Ph.D. degree in Electrical Engineering from the University of Melbourne, Australia in 1992.

Professor Feng was a Lecturer/Senior Lecturer at University of New South Wales, 1992-1999. He has been with City University of Hong Kong since 2000, where he is now a Chair Professor of Mechatronic Engineering. He has received Alexander von Humboldt fellowship, the IEEE Computational Intelligence Society Fuzzy Systems Pioneer Award, the IEEE Transactions on Fuzzy Systems Outstanding Paper Award, the outstanding research award and President award of City University of Hong Kong, and several best conference paper awards. He is listed as a SCI highly cited researcher by Clarivate Analytics since 2016. His research interests include intelligent systems and control, networked control systems, and multi-agent systems and control.

Professor Feng is a fellow of IEEE. He has been an Associate Editor of *IEEE Trans. Automatic Control, IEEE Trans. on Fuzzy Systems, IEEE Trans. Systems, Man, & Cybernetics, Mechatronics, Journal of Systems Science & Complexity, Journal of Guidance, Navigation & Control*, and *Journal of Control Theory and Applications*. He is also on the advisory board of *Unmanned Systems*.