Editorial

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Biographical notes: Guanghui Wen received his PhD in Mechanical Systems and Control from the Peking University, Beijing, China in 2012. From 2012 to 2013, he was a Research Associate and Postdoctoral Fellow with the University of New South Wales at Canberra, Campbell, ACT, Australia. In 2014, he was a Visiting Research Fellow with the School of Electrical and Computer Engineering, Royal Melbourne Institute of Technology University, Melbourne, VIC, Australia, for three months. He is currently a Lecturer with the Department of Mathematics, Southeast University, Nanjing, China. His current research interests include cooperative control of multi-agent systems, analysis and synthesis of complex dynamical networks, robust control, and cyber-physical systems. He was a recipient of the Best Student Paper Award in the 6th Chinese Conference on Complex Networks in 2010. He is an Associate Editor of the *Asian Journal of Control*.

Distributed control of collective behaviours in multi-agent systems has become a focal topic of great interest in the past few years. Typical collective behaviours of multi-agent systems include consensus, synchronisation, swarming, rendezvous and so forth. The desire to understand such coupling systems has brought along challenges as well. Researchers have developed a variety of successful tools to analyse and control the behaviour of a single system. However, there is unfortunately no general tool to analyse, predict and control the collective behaviours of multi-agent systems. Undoubtedly, research on collective behaviours of multi-agent systems will not only facilitate advances in theoretical study, but also benefits various applications of distributed systems.

This special issue focuses on theoretical and technological advances in distributed control of multi-agent systems, with special attention to the following areas: distributed consensus of multi-agent systems, time-synchronisation of wireless sensor networks, and engineering applications of distributed control algorithm. It contains six papers, the contents of which are summarised below. In the area of the distributed consensus of multi-agent systems, Li et al. study the node-to-node consensus problem of second-order nonlinear multi-agent systems via pinning control approach in their paper entitled as 'Second-order node-to-node consensus of nonlinear multi-agent systems via pinning control'. A survey on finite-time leaderless and leader-following consensus in multi-agent systems under continuous-time protocols is provided by Du et al. in their paper 'A survey of continuous finite-time consensus algorithms in multi-agent systems'. In 'Averaging approach for consensus of fast switching multi-agent networks with delayed communications', by Jia and Sun, consensus for a class of multi-agent systems with fast switching topology in the presence of delayed communication is investigated. In the area of time-synchronisation of wireless sensor networks, Bi et al. study the time

synchronisation problem in wireless sensor networks by using some energy-efficient spanning tree protocols. Regarding the area of engineering applications of distributed control algorithm, hidden-geometry phenomenon of epidemic spreading in metapopulation networks is investigated by Qian and Qi in their paper 'Analysis for hidden-geometry phenomenon of epidemic spreading in metapopulation networks'. In 'Hierarchy robust control for unmanned quadrotor helicopter without linear velocity measurement', by Zhao et al., a hierarchy robust control strategy for unmanned quadrotor helicopter is constructed.

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