



學術報告

Finite-time Consensus Protocols for Multi-agent Systems with an application to attitude synchronization problem



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Biography: Jieqiang Wei was born in Qufu, China, in May 1987. He obtained the B.Sc. degree from Qufu Normal University, the M.Sc. degree from Beijing Normal University, and the Ph.D. degree from University of Groningen, Groningen, The Netherlands. Currently, he is a Post-Doctoral Researcher at the ACCESS Linnaeus Center and the Department of Automatic Control, School of Electrical Engineering, KTH Royal Institute of Technology, Sweden. His research interests include networked control systems, nonlinear systems and control, stochastic systems, game theory.

In this talk, we discuss some finite-time control protocols and the corresponding (dis)advantages comparing to asymptotic cases. Then a finite-time consensus protocol is proposed for multi-dimensional multi-agent system. Sufficient and necessary conditions are provided to guarantee finite-time convergence and boundedness of the solutions. It turns out that the number of agents which have continuous control law plays an essential role for finite-time convergence. As an application of the proposed controller, the finite-time attitude synchronization problem is considered, where the rotation of each rigid body is expressed using the axis-angle representation. Two discontinuous and distributed controllers using the vectorized signum function are analyzed, which guarantee almost global and local convergence, respectively. Different from the holonomic multi-agent system, only sufficient conditions are provided to guarantee finite-time convergence and boundedness of the solutions.