On Distributed and Cooperative Control Design for Networks of Dynamical Systems

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Abstract

In a variety of modern man-made systems, it is desirable to synthesize a cooperative behavior in groups of individual dynamical agents by distributed control laws. Examples include multi-vehicle coordination and formation flight problems, robot cooperation in production lines, as well as power balancing in micro-grids, and many more. As a consequence, distributed and cooperative control has become one of the major research fields within automatic control over the past decade. In this talk, we address output synchronization problems for linear multi-agent systems as well as cooperative disturbance rejection and reference tracking problems for groups of autonomous agents subject to exogenous inputs. Suitable control design methods are presented as a solution to a variety of practically relevant distributed coordination and cooperative control scenarios and illustrated by means of numerical examples.

Biographical Information

Georg Seyboth is research and teaching assistant at the Institute for Systems Theory and Automatic Control (IST), University of Stuttgart. He studied Engineering Cybernetics at the University of Stuttgart, Germany and Royal Institute of Technology (KTH), Sweden. He got his Diploma degree from the University of Stuttgart in December 2010 and joined the IST in January 2011. He is Ph.D. student in the Graduate School Simulation Technology (GS SimTech) within the Stuttgart Research Centre for Simulation Technology. His research interests are focused on distributed and cooperative control in homogeneous and heterogeneous networks of dynamical systems.