

Graph Rigidity (Persistence) for Directed Formation Control

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Abstract

This talk considers problems of control of multi-agent formations that can be modeled by undirected or directed graphs. The graphical model can capture specific design considerations from each of sensing, communication and control architectures, or a mixture of them. The characterization using these formation graphs and the associated control laws thus can be applied in autonomous mobile robotic networks of various types.

Central to this talk is the development and application of graph rigidity theory. Subject to time constraints, a wide range of issues will be covered: from fundamental problems like formation modeling and characterization of formation information structures to task-oriented studies such as motion coordination, formation operations and formation robustness.

Biographical Information

Changbin (Brad) Yu received B.Eng from Nanyang Technological University (NTU), Singapore in 2004, and a PhD from the Australian National University (ANU), Canberra, Australia in 2008. In the same year, he joined the faculty of the ANU College of Engineering and Computer Science, where he currently holds an ARC Queen Elizabeth II Fellowship. He is also a senior member of IEEE, a member of IFAC Technical Committee, a subject editor of International Journal of Robust and Nonlinear Control, and an associate editor of System and Control Letters. His current research interests include control of networked systems, multi-agent (robotic) systems, mobile sensor networks etc.

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