

Resilient and Robust Cooperative Control in Networked Multi-agent Systems

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Abstract:

A networked multi-agent system refers to as a cooperative group of autonomous agents that interact over a network for achieving certain collective behaviour. Due to the applications of networked multi-agent systems in several domains, including distributed robotics, sensor networks, and power grids, they have been a focus of intense research activity over the past several decades. Much of the past work on networked multi-agent systems assumes an ideal situation where agents, sensors, actuators, and communication networks are reliable. However, this assumption might not necessarily be true as these components are subject to potential vulnerabilities due to faults and cyberattacks.

This talk focuses on the resilient-by-design cooperative control solutions in network multi-agent systems to ensure the safety and normal operation under potential disturbances. The particular emphasis is on the problem of resilient consensus in such systems. The applications of the results to robotic systems and inverter-based power grids are briefly explained.