Large-Scale Complex Networked Systems: Analysis and Control

Proposal for IFAC 2020 Open Invited Track

Organizers:

Xiaofan Wang (Shanghai University, China, xfwang@sjtu.edu.cn)

Ming Cao (University of Groningen, Netherland, ming.cao@gmail.com)

Wei Ren (University of California, Riverside, USA, ren@ece.ucr.edu)

IFAC Technical Committee: TC5.4 "Large-Scale Complex Systems"

Over the past decades, the world has witnessed an exponential growth in the level of complexity and interconnection among industrial and non-industrial systems, mainly fuelled by advances in computing, sensing, communication and control technologies. Physical and digital worlds are becoming increasingly intertwined, giving rise to systems such as CPS and IoT with emergent complex interactions. Firms of the present time operate in a highly complex networked environment and there is an ever more increased concern for integration of various technologies and economic, environmental and social aspects. Consequently, analysis and design of control must take into account more aspects and needs new skills and tools. At the same time, rapid advances in technologies provide effective tools and adequate technical infrastructures to support the design and implementation of control for large-scale complex system applications at present and in the future.

40 pt
0.556 in
14.1 mm

In particular, empirical studies of complex networks have led to a variety of techniques and models to understand the organizing principles of complex networked systems. The aim of this track is to bring together different communities working on different aspects of complex networked systems. The track will discuss some fundamental issues on control of complex networks, including controllability and observability of interdependent complex networks, mathematical and algorithmic tools for analysis and design of large-scale networked systems, AI and Data-driven control of systems with multi-level, multi-scale and multi-temporal features, and potential applications to real-world networked systems. We expect this track will add new dimensions for the developing area of control of complex networked systems.