Data-based learning for control and optimization of complex networked systems

Invited Session Chairs:
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Due to the rapid development of computing, communication and sensing technology, complex networked systems become more and more ubiquitous in real life. Their applications can be found in areas such as mobile sensor networks, autonomous vehicle formations, intelligent transportation systems, smart grids and so on. The large scale of the networked system and the complex dynamics of the components make precise modeling of the system difficult. Data-based learning technology provides opportunities to adaptively learn high-quality models of the system and enables new control and optimization paradigms for the large scale networked systems. The key research problems include developing proper learning theories and analyze the integrated learning, control and optimization algorithms. This invited session will focus on new analysis and synthesis approaches for data-based learning for control and optimization of complex networked systems. Research on various aspects of data-based learning such as modeling, controller design, new coordination tasks and real world applications will be welcomed. It aims to provide an international forum for researchers in various fields such as applied mathematics, social science, control engineering, as well as computer science to present, share, and summarize the most recent developments and ideas on related topics. Topics of the session include but are not limited to, the following:

1. Data-based modeling and identification of complex networked systems
2. Online distributed optimization and coordination
3. Consensus, formation, and containment control of networked systems
4. Robust distributed control methods
5. Data-based learning and adaptive control of complex networked systems
6. Distributed coordination subject to input saturation
7. Sampled-data and event-triggered distributed control
8. Distributed diagnosis and fault-tolerant control
9. Distributed control and optimization applications