浙江大学网络传感与控制研究组

group of NEtworked Sensing and Control

學術報告

Controlling Temporal Networks

报告人： Dr. Aming Li

University of Oxford

时间： 12月25日 星期二 上午 10:00

地点： 浙江大学工控新楼501室

***Biography*: Dr. Aming Li currently works as a postdoc fellow at Foster Lab in the University of Oxford. His research interests cover network control and evolutionary game theory. He got his B.Sc. degree from Department of Mathematics, Zhejiang University of Technology in 2011. Supervised by Prof. Long Wang, he obtained his Ph.D. in 2017 from Center for Systems and Control, Peking University, China. During Aming's Ph.D. program, from Oct. 2014 to Mar. 2017, he worked as a visiting research scholar in Center for Complex Network Research (Northeastern University, USA) under the direction of Prof. Albert-László Barabási. From Oct. 2015 to Mar. 2017, Aming also worked in Prof. Jeff Gore's group as a visiting student at Massachusetts Institute of Technology. He is a recipient of the long-term Postdoctoral Fellowship from the Human Frontier Science Program Organization, France.**

In practical terms, controlling a network requires manipulating a large number of nodes with a comparatively small number of external inputs, a process that is facilitated by paths that broadcast the influence of the directly-controlled nodes to the rest of the network. In temporal networks, such paths are normally seldom instantaneously available. In this talk, I will show that temporal networks can, compared to their static (i.e. aggregated) counterparts, reach controllability faster, demand orders of magnitude less control energy, and the control trajectories are more compact. I will also show that the energy cost for controlling temporal networks are determined solely by the spectral properties of an "effective" Gramian matrix. And the scaling of control energy is largely dictated by the first and the last network snapshots in the temporal sequence, independent of the number of intervening snapshots, the initial and final states, and the number of driver nodes.