



Synchronization of Dynamic Network

via Phase Analysis

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摘要:

In this talk, the synchronization of heterogeneous agents interacting over a dynamical network is studied. The edge dynamics can model the inter-agent communications which are often heterogeneous by nature. They can also model the controllers of the agents which may be different for each agent or uniform for all the agents. Novel synchronization conditions are obtained for both cases from a phase perspective by exploiting a recently developed small phase theorem. The conditions scale well with the network and reveal the trade-off between the phases of node dynamics and edge dynamics. We also study the synchronizability problem which aims to characterize the allowable diversity of the agents for which controllers can be designed so as to achieve synchronization. The allowable diversity is captured in terms of phase conditions engaging the residue matrices of the agents at their persistent modes. Controller design algorithms are provided for the cases of agent-dependent and uniform controllers, respectively.

报告人简介： Dan Wang is a Postdoctoral Fellow at KTH Royal Institute of Technology. She received the Ph.D. degree in electronic and computer engineering from the Hong Kong University of Science and Technology, Hong Kong SAR, China, in 2020, where she was a Postdoctoral Fellow from October 2020 to March 2022. From January 2018 to July 2018, she was a visiting scholar at the Coordinated Science Laboratory, University of Illinois at Urbana Champaign, Urbana, IL, USA. Her research interests include systems and control theory, phase theory, dynamical networks, and control of epidemics.

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