

# 学术报告会

时 间: 7月11日 (周四) 10:00-11:30

地 点: 电院群楼2-410

## Control of Multi-agent systems: macroscopic versus microscopic

胡晓明

瑞典皇家理工学院



### Abstract:

In this talk we discuss two different approaches for control of multi-agent systems. The first concerns systems of large population for which the main control goal is to shape certain macroscopic properties of the system and for such systems indexing the agents is either unnecessary or impractical; the second concerns systems for which a desired formation should be achieved via designing a proper inter-agent graph and using local and relative information only. We use two case studies to demonstrate these approaches. We discuss first the problem of crowd dynamics and optimal intervention for which two optimal control strategies are proposed for shaping and evacuating the crowd. We then revisit the classical consensus problem for linear systems and discuss the relation between optimality and interaction topology. We will first show that optimal control for the overall system can be realized in a distributed way but requires a special interaction topology. We will then proceed to discuss the case in which the interaction topology is given.

### Biography:

胡晓明, 1983 年于中国科技大学获学士学位, 1989年于美国亚历桑那州立大学获哲学博士学位, 导师为著名非线性系统专家Christopher Byrnes。1989年获瑞典皇家理工学院(KTH)的Göran Gustafsson博士后奖学金, 1991年后在KTH数学系任职。2003 年晋升为优化与系统理论方向正教授。现任优化与系统理论实验室主任, 曾兼任KTH机器人中心副主任, 及KTH网络系统国家重点中心(ACCESS Linnaeus Center)的执委会委员, 及该两中心董事会董事。胡晓明教授领导或参与了大量来自欧盟, 瑞典研究基金会, 瑞典战略研究基金会, 后勤装备部及瑞典空间中心的科研项目, 以及大量国际会议的组织工作, 国际期刊的编委工作。研究方向主要为非线性反馈控制、非线性观测器设计、传感与主动感知、多自体系统的建模, 分析及控制等, 是目前活跃在国际控制理论领域的著名学者。他迄今发表200多篇论文及两本专著。