上海交通大学自动化系
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学术报告会

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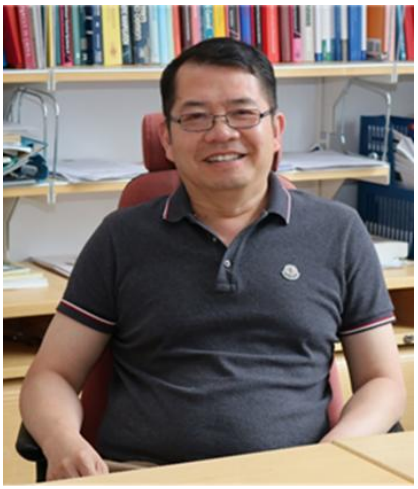

Emergence beyond consensus for multi-agent systems

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摘要:

In this talk we discuss how to use tools such as non-cooperative differential games, optimal control and manifold theory to achieve emergence for a multi-agent system, in particular non-consensus emergence, which is clearly connected to Distributed Artificial Intelligence (DAI) since group intellectual behavior in DAI is based on individual intellectual behaviors. In many scenarios, agents in a MAS model can act cooperatively, competitively or exhibit neutral behaviors.To handle those complexities, it is very useful to characterize the invariances that define the emergence. Such emergence can be tightly connected to a Nash equilibrium, or rather to an invariant manifold of Nash equilibria. In this talk we will use some cases of study to illustrate our thoughts. We begin with crowd dynamics, then use Turing’s model for the diffusion of morphogens to explore its connection to emergence by self-organization, finally we will discuss emergence in a non-cooperative differential game framework in which emergence is achieved by Nash equilibrium strategies in an intrinsic way in the sense that they are only attributed to the inter-agent interaction and geometric properties of the network.

简介:

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 Linaeus 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。