上海交通大学自动化系
Department of Automation
Shanghai Jiao Tong University

系统控制与信息处理教育部重点实验室
Key Laboratory of System Control and Information Processing, Ministry of Education

学术报告会

时间：2016年5月27日(周五)10:00
地点：电院群楼2-410会议室

Analysis and Control of Partially-Observed Discrete-Event Systems

Xiang Yin
University of Michigan

Abstract:
Cyber-physical systems are at the core of key infrastructure in our society. Ever-increasing demands for safety, security, performance, and certification of these critical systems put stringent constraints on their design and necessitate the use of formal model-based approaches to synthesize provably-correct feedback controllers. This talk presents a recently developed novel methodology for synthesis of control and sensing strategies for discrete event systems, an important class of cyber-physical systems. We will present a uniform approach for synthesizing property enforcing supervisors as well as sensor activation strategies for a wide class of design requirements, e.g., safety and security. The methodology presented in this talk has the following novel features: (i) it explicitly considers and handles imperfect state information, due to sensor noise, and limited controllability, due to unexpected environmental disturbances; and (ii) it is a uniform information-state-based approach that can be applied to a variety of user-specified requirements; and (iii) it is a formal model-based approach, which results in provably correct solutions; and (iv) the methodology and associated theoretical foundations developed are generic and applicable to many types of complex cyber-physical systems with safety-critical requirements, in particular networked systems such as aircraft electric power systems and intelligent transportation systems.

Biography:
Xiang Yin was born in Hefei, China, in 1991. He received the B.Eng degree from Zhejiang University in 2012 and the M.S. degree from the University of Michigan, Ann Arbor, in 2013, both in Electrical Engineering. He is currently a Ph.D candidate in the Electrical Engineering: System program at the University of Michigan, Ann Arbor. Mr. Yin's research interests include supervisory control of discrete-event systems, model-based fault diagnosis, formal methods, game theory and their applications to cyber and cyber-physical systems. He served as session chair of Discrete-Event System sessions in the American Control Conference and the IEEE Conference on Decision and Control. He was selected as an Outstanding Reviewer by Automatica.