

DEPARTMENT OF MECHANICAL & AEROSPACE ENGINEERING

WILLIAM MAXWELL REED SEMINAR SERIES

“Towards Scalable Autonomy”

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Abstract:

Despite amazing recent progress in computing and artificial intelligence, robots with even a fraction of human agility remain firmly in the realm of science fiction. Why are simple things, such as walking and grasping, so deceptively difficult? One key reason is scalability--a crucial issue that has hindered the extensive use of advanced robotic systems in our everyday scenarios. Scalability can be due to the complexity of tasks, the high degree of freedoms/dimensions of physical dynamics, and/or the need for a large number of robots working together. This talk will present some of our recent attempts to address the scalability challenge in robotics, including techniques to achieve fast task planning for robots with a high degree of freedom and trajectory planning for contact-rich manipulation tasks. If time permits, I will also talk about some of our recent work on decentralized control and swarming robots, which aims to deal with scalability due to the number of robots to control. We will conclude with a discussion about the opportunities and challenges for robotics and control in the AI era.

Speaker Bio:



Hai Lin is a professor at the Department of Electrical Engineering, University of Notre Dame, where he got his Ph.D. in 2005. Before returning to his alma mater, he worked as an assistant professor at the National University of Singapore from 2006 to 2011. Dr. Lin's teaching and research activities focus on the multidisciplinary study of fundamental problems at the intersections of control theory, formal methods, AI, and robotics. His current research thrust is motivated by challenges in cyber-physical systems, long-term autonomy, multi-robot cooperative tasking, and human-machine collaboration. Dr. Lin has served on several committees and editorial boards, including IEEE Transactions on Automatic Control and Unmanned Systems. He served as the chair for the IEEE CSS Technical Committee on Discrete Event Systems from

2016 to 2018, the program chair for IEEE ICCA 2011, 2024, and IEEE CIS 2011, and the chair for IEEE Systems, Man and Cybernetics Singapore Chapter for 2009 and 2010. He is a senior member of IEEE and a recipient of the 2013 NSF CAREER award.

Date: Friday, October 4, 2024
Place: WT Young Library 1-62

Time: 3:00 PM EST
Contact: Dr. Jonathan Wenk

Attendance open to all interested persons