

## ECE & MIE JOINT SEMINAR

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### **Constrained Motion Control and Optimization in Robotics and Additive Manufacturing**

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Date: Tuesday, Feb 10, 2015

Time: 1:30 to 2:30 pm

Location: ECE 202

#### ABSTRACT

The past few decades have seen many successful applications of motion control on industrial robots and machines. Stability and tracking accuracy are the main design requirements for an industrial motion controller. However, as the emerging applications in robotics and automation get further away from industry and closer to our everyday life, the corresponding motion control designs need to consider more domain-specific problems beyond stability and tracking accuracy. Satisfying different constraints that might be changing and unpredictable while optimizing specific performance indexes for the particular application become major challenges for the design of next generation of motion controllers. In my research, I investigate various motion control problems in emerging applications, and develop domain-specific control algorithms to optimize the performances of the systems subject to different constraints. In this talk, I will highlight my researches on constrained motion control theory and applications to three major areas, including: 1) human-centered assistive robotics; 2) The control of autonomous robotic vehicles, including unmanned aerial vehicles and ground vehicles; 3) additive manufacturing and 3D printing.

Bio: Dr. Lu Lu received the M.S. and Ph.D. degrees from the School of Mechanical Engineering, Purdue University, West Lafayette, IN, USA, in December 2010 and August 2013, respectively, and the B.Eng. degree in mechatronic engineering from Zhejiang University, Hangzhou, China, in June 2008. He has been with the Center for Automation Technologies and Systems, Rensselaer Polytechnic Institute, Troy, NY, USA, since Sep 2013 as Postdoctoral Research Associate. His research interests include control, robotics, manufacturing, sensor fusion and human machine interaction.

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