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Prof. Qianchuan Zhao received the B.E. degree in automatic control in July 1992, the B.S. degree in applied mathematics in July 1992, and MS and Ph.D. degrees in control theory and its applications in July 1996, all from Tsinghua University, Beijing, China. He is currently a Professor and Director of the Center for Intelligent and Networked Systems (CFINS) Department of Automation, Tsinghua University. His current research focuses on the modeling, control and optimization of complex networked systems under uncertain environment. Dr. Zhao is an editor for the IEEE Transactions on Automation Science and Engineering and Editor-in-Chief of the journal Results in Control and Optimizaition. He was awarded The National Science Fund for Distinguished Young Scholars of China in 2014.

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Title of the talk: Online Trajectory Planning for the Planetary Powered-Descent Guidance under uncertain environments

The powered descent guidance problem for planetary landing, also known as soft landing problem, is to find a fuel-optimal trajectory that takes a vehicle from the given initial position to a prescribed final location with zero speed. The problem is very important for planetary exploration and reuse of commercial rockets. In this talk, we will review some recent offline and online solutions that based on lossless convexification techniques. We will focus on computation efficient warm-start solutions under uncertain environments and point out connections between model predication control (MPC), second-order cone programming (SOCP) problems. We will also mention the possible solutions with deep learning.