上海交通大学自动化系
Department of Automation
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学术报告会

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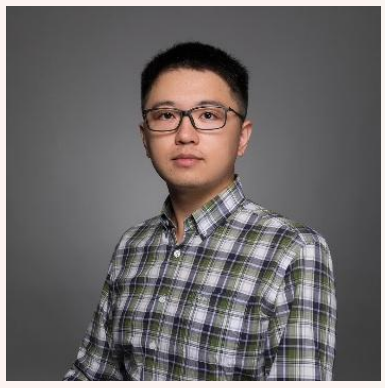

The Research and Development of Iterative Optimal Control Algorithms for Robotic Systems

Ass.Prof. Yuqing Chen
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摘要:

Optimal control provides a systematic approach to control robotic systems. Given an exact model of a robot, optimal control theory could find the optimal control inputs that minimize a user-defined cost function. However, optimal control has two limitations when it comes to practical applications: one is the model bias, which makes it nontrivial to use imperfect model information while ensuring the control performance; the other is the excessive computation required within the time constraint in real-time optimization. In this talk, Dr. Yuqing Chen will present his recent works on addressing the aforementioned limitations. The talk will focus on

(1) development of a hardware-in-the-loop iterative optimal feedback control without model-based future prediction;

(2) an iterative online optimal feedback control method with theoretically established convergence and optimality properties; and

(3) a recent extension of the iterative optimal control to legged robotic systems.

This talk will summarize the recent development of Dr. Chen’s works on novel iterative optimal control theory and applications, provide a new angle to develop high-performance robot control algorithms.

简介:

Dr. Yuqing Chen is an assistant professor at Department of Mechatronics and Robotics, School of Advanced Technology, Xi’an Jiaotong-Liverpool University (XJTLU). Dr. Chen received his Ph.D. degree from Singapore University of Technology and Design (SUTD), M. Eng . and B.Eng. degrees in Control Science and Engineering from Harbin Institute of Technology (HIT). Dr. Chen has published papers in journals including IEEE Transactions on Robotics (TRO), IEEE Transactions on Automatic Control (TAC), IEEE/ASME Transactions on Mechatronics, and IEEE Robotic and Automation Letters (RAL). His main research interests include robot control, optimal control of dynamical systems and hardware-in-the-loop optimal control theory.