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：2012年7月23日(周一) 10:00-12:00

地点：电院群楼2-412会议室

Estimation, Sensing and Control of Tire/Road Interactions

Prof. Jingang Yi

The State University of New Jersey, USA

Abstract:

Pneumatic tires and rubber wheels are critical components in mobile systems such as vehicles and ground robots that are widely used for passenger and goods transportation. The tire/road interactions in these systems play an extremely important role for not only system design but also safe operation. In this talk, I will first present two different modeling schemes for on-line estimation of the tire/road friction coefficient and braking control for automated vehicles. I will then present the development of a tire rubber deformation sensing system for enhancing real-time tire/road friction estimation. An analytical sensing output model that is used to capture the tire/road friction characteristics will be presented. The testing data has showed the feasibility of the estimate of wheel/ground interactions such as tire friction coefficient. I will further discuss how to use the developed tire model to understand stability and agility of professional racing car driving skills and design human-inspired autonomous aggressive maneuvers for active safety control.

Biography:

Prof. Jingang Yi is currently an Assistant Professor in mechanical engineering and a graduate faculty member in electrical and computer engineering at Rutgers University. His research interests include autonomous robotic systems, mechatronics, dynamic systems and control, automation science and engineering, with applications to biomedical systems, civil infrastructural and transportation systems. He has co-authored papers that have been awarded the Best Student Paper Award of the 2012 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, the Best Conference Paper Award Finalists of the 2007 and 2008 IEEE International Conference on Automation Science and Engineering etc. Dr. Yi is a member of American Society of Mechanical Engineers (ASME) and a senior member of the IEEE. He serves as an Associate Editor of the IEEE Trans on Automation Science and Engineering and the IEEE Robotics and Automation Society (RAS) Conference Editorial Board (since 2008). He also served as a Guest Editor of IEEE Transactions on Automation Science and Engineering in 2009 and an Associate Editor of the ASME Dynamic Systems and Control Division Conference Editorial Board from 2008 to 2010.