



THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

**Data Rate Theorems for
Stabilization of Networked Linear Systems**
by
Dr. Keyou You
Tsinghua University
China

Date : 8 Oct., 2013 (Tue.)
Time : 2:00pm – 3:00pm
Venue : Room 833 Ho Sin Hang Engineering Building
The Chinese University of Hong Kong

Abstract

Classical control theory is concerned with using information in a feedback loop, and usually assumes that limitations in communication links do not significantly affect the control performance. Communication theory studies how to reliably transmit messages from one point to another, regardless of the use of the messages. Thus control and communication have evolved as separate subjects. The emergence of networked control systems brings together the ideas from both control and communication theories to study the tradeoff between the control performance and communication.

In this talk, we address the stabilization problem of a discrete-time linear dynamical system over a digital communication channel. In particular, we are interested in the minimum information rate required to achieve stabilization of a networked linear system from the information-theoretic and network-theoretic approaches, respectively. It is shown that the topological entropy of the system imposes a fundamental limitation on the information rate for stabilization.

Biography

Keyou You was born in Jiangxi Province, China, in 1985. He received the B.S. degree in statistical science from Sun Yat-sen University, Guangzhou, China, in 2007 and the Ph.D. degree in electrical and electronic engineering at the Nanyang Technological University (NTU), Singapore in 2012.

He was with the ARC Center for Complex Dynamic Systems and Control, the University of Newcastle, Australia, as a visiting scholar from May 2010 to July 2010, and with the Sensor Network Lab at NTU as a Research Fellow from June 2011 to June 2012. Since July 2012, he has been with the Department of Automation, Tsinghua University, China as a Lecturer. From May 2013 to July 2013, he held a visiting position in The Hong Kong University of Science and Technology, Hong Kong. His research interests include networked control and estimation, distributed algorithm, and sensor network. Dr. You was selected to the national “1000-Youth Talent Program” of China in 2013. He won the Guan Zhaozhi best paper award at the 29th Chinese Control Conference (CCC), and was invited as a panelist of the plenary session “what young control scholars are doing and thinking?” at the 32nd CCC in 2013.

**** ALL ARE WELCOME ****

Host: Professor Dah-Ming Chiu (Tel: 3943-8357, Email: dmchiu@ie.cuhk.edu.hk)
Enquiries: Information Engineering Dept., CUHK (Tel.: 3943-8385)