

数学与系统科学研究院学术报告

报告题目: Finite-Level Quantized Feedback Control for Linear Systems

报告人: Minyue Fu, School of Electrical Engineering and Computer Science, University of Newcastle Callaghan, NSW 2308 Australia

时间地点: 2007年1月19日下午3:00—4:30, 思源楼712

摘要:

This paper studies quantized feedback control of discrete-time linear systems using a finite-level quantizer. Motivated by the fact that most feedback communication channels allow a moderate bit rate, we are not particularly concerned with the problem of finding the minimum bit rate of feedback for a given control objective. Instead, we assume that a moderate bit rate is available and our task is to find a quantization strategy which is easily implementable and achieves a given control objective. We introduce a dynamic scaling method and combine it with a known logarithmic quantization method. Using this approach, satisfactory control of linear systems can be achieved using a quantizer with a moderate number of quantization levels. Two main advantages of this approach are 1) It is very easy to implement, and 2) The closed-loop system behaves as if there were no limitation on the number of quantization levels when the state of the system is within a "normal" operating range. These features are important for practical applications of quantized feedback control.

报告人简介及联系方式:

Minyue Fu received his Bachelor's Degree in Electrical Engineering from the University of Science and Technology of China, Hefei, China, in 1982, and M.S. and Ph.D. degrees in Electrical Engineering from the University of Wisconsin-Madison in 1983 and 1987, respectively.

From 1983 to 1987, he held a teaching assistantship and a research assistantship at the University of Wisconsin-Madison. He worked as a Computer Engineering Consultant at Nicolet Instruments, Inc., Madison, Wisconsin, during 1987. From 1987 to 1989, he served as an Assistant Professor in the Department of Electrical and Computer Engineering, Wayne State University, Detroit, Michigan. For the summer of 1989, he was employed by the Universite Catholique de Louvain, Belgium, as a Maitre de Conferences Invited. He joined the Department of Electrical and Computer Engineering, the University of Newcastle, Australia, in 1989. Currently, he is a Chair Professor in Electrical Engineering and Head of School of Electrical Engineering and Computer Science. In addition, he was a Visiting Associate Professor at University of Iowa in 1995-1996, and a Senior Fellow/Visiting Professor at Nanyang Technological University, Singapore, 2002.

His main research interests include control systems, signal processing and communications. He has been an Associate Editor for the IEEE Transactions on Automatic Control and Journal of Optimization and Engineering. He is a Fellow of IEEE.

Email: minyue.fu@newcastle.edu.au