数学与系统科学研究院学术报告

报告题目：Lectures on Randomized Algorithms for Systems and Control(Lecture 3, 4 and 5)

报 告 人：Roberto Tempo, CNR-IEIIT

时间地点：9:00-11:10AM, April 10, 2013, Room 703, Siyuan Building(Lecture 3, 4 )

10:00-11:00AM, April 11, 2013, Room 703, Siyuan Building(Lecture 5)

摘要：

In recent years, we have seen a growing interest in randomization of uncertain systems with the objective to reduce the complexity of feedback. In these lectures, we provide a perspective of this research area and discuss several topics which include the connections between randomized algorithms and statistical learning theory, and the computation of the sample complexity. In particular, we address system's analysis and design using sequential and non-sequential randomized methods, and analyze advantages and disadvantages of these approaches.

Lecture 1: Uncertain systems(arranged on March 12, 2013)

Structured and parametric uncertainty

Worst-case analysis and design

Lecture 2: Probabilistic methods for analysis(arranged on March 12, 2013)

Computation of the probability of performance and worst-case performance

Multivariate random variable generation

Lecture 3: Monte Carlo and Las Vegas randomized algorithms(9:00-10:00AM, April 10, 2013)

Sample complexity and Chernoff bounds

Computational complexity of randomized algorithms

Lecture 4: Probabilistic methods for control design (10:10-11:10AM, April 10, 2013)

Sequential and non-sequential algorithms for convex problems

A posteriori analysis

Lecture 5: Statistical learning theory(10:00-11:00AM, April 11, 2013)

Vapnik-Chervonenkis theory

Non-sequential algorithms for nonconvex problems

报告人简介：

Roberto Tempo was born in Cuorgnè, Italy, in 1956. In 1980 he graduated in Electrical Engineering at Politecnico di Torino, Italy. After a period spent at Politecnico di Torino, he joined the National Research Council of Italy (CNR) at the research institute IEIIT, Torino, where he is a Director of Research of Systems and Computer Engineering since 1991. He has held visiting and research positions at Kyoto University, The University of Tokyo, University of Illinois at Urbana-Champaign, German Aerospace Research Organization in Oberpfaffenhofen and Columbia University in New York.

Dr. Tempo's research activities are mainly focused on the analysis and design of complex systems with uncertainty, and various related applications within information technology. On these topics, he has published more than 170 research papers in international journals, books and conferences. He is also a co-author of the book “Randomized Algorithms for Analysis and Control of Uncertain Systems,” Springer-Verlag, London, published in two editions in 2005 and 2013.

He is a Fellow of the IEEE for “Contributions to Robust Identification and Control of Uncertain Systems” and a Fellow of the International Federation of Automatic Control (IFAC) for “Contributions to the Analysis and Control of Uncertain Systems, for Pioneering the Probabilistic Approach to Robustness.” He is a recipient of the “Outstanding Paper Prize Award” from the IFAC for a paper published in the journal Automatica, and of the “Distinguished Member Award” from the IEEE Control Systems Society. He is a Corresponding Member of the Academy of Sciences, Institute of Bologna, Italy, Class Physical Sciences, Section Technical Sciences.

Dr. Tempo is currently an Editor and Deputy Editor-in-Chief of Automatica, a Senior Editor of the IEEE Transactions on Automatic Control, and an Editor at Large of the Asian Journal of Control. He has been Editor for Technical Notes and Correspondence of the IEEE Transactions on Automatic Control in 2005-2009.

In 2010 he has served the IEEE Control Systems Society as President and, during the period 2002-2003, as Vice-President for Conference Activities. He is General Co-Chair for the IEEE Conference on Decision and Control, to be held in Florence, Italy, in 2013 and he was Program Chair of the first joint IEEE Conference on Decision and Control and European Control Conference, Seville, Spain, 2005.