数学与系统科学研究院学术报告

报告题目：Gossips and Prejudices: Ergodic Randomized Dynamics in Social Networks

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时间地点：300 -400pm, Mar 25, Room 712, Siyuan Building

摘要：In this talk, we study a new model of opinion dynamics in social networks which has two main features. First, agents asynchronously interact in pairs, and these pairs are chosen according to a random process. Following recent literature, we refer to this communication model as "gossiping''. Second, agents are not completely open-minded, but instead they take into account their initial opinions, which may be thought of as their "prejudices''. In the literature, such agents are often called "stubborn". We show that the opinions of the agents fail to converge, but persistently undergo ergodic oscillations, which asymptotically concentrate around a mean distribution of opinions. This mean value is exactly the limit of the synchronous dynamics of the expected opinions.

In the second part of the talk, we demonstrate how a modified version of this approach is useful for sensor localization of wireless networks. In particular, we show that the optimal location (in a least-squares sense) of the sensors may be obtained by a randomized algorithm, provided that a suitable time-averaging operation is performed.

Keywords: Social networks, opinion dynamics, randomized algorithms, optimal sensor localization

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.