数学与系统科学研究院学术报告

报告题目：Formation Control: Distance Mismatch and Nonrobust Behavior

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时间地点：10:00-11:00am, April 8, 2013, Room 703, Siyuan Building

摘要：

Suppose a formation shape of point agents, in an ambient space dimension of 1,2 or 3, is being controlled through active control of a nominated set of interagent distances. Suppose further that the two agents defining any such distance both try to correct any difference between the actual distance and its desired value. Finally suppose that either there are unequal biases in the measurements of one or more distances by the associated pair of agents, or the two agents have differing views as to what the correct distance should be. It is easy to see that with two agents only, such a situation results in both agents asymptotically moving at the same constant nonzero velocity with, in the second scenario, a spacing between the two spacings deemed by the two agents to be the correct distance. Much the same happens for a group of agents confined to move on a straight line. The talk will explain that result, and then go on to consider what happens in the case of formations in an ambient two-dimensional and three-dimensional space. The results challenge conventional assumptions in many algorithms based on consensus ideas.

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Brian **Anderson** was born in Sydney, Australia, and educated at Sydney University in mathematics and electrical engineering, with PhD in electrical engineering from Stanford University in 1966. He is a Distinguished Professor at the Australian National University and Distinguished Researcher in National ICT Australia (NICTA). His awards include the IFAC Quazza Medal in 1999, the IEEE Control Systems Award of 1997, the 2001 IEEE James H Mulligan, Jr Education Medal, and the Bode Prize of the IEEE Control System Society in 1992, and a number of other medals and best paper prizes. He is a Fellow of the Australian Academy of Science, the Australian Academy of Technological Sciences and Engineering, the Royal Society, Honorary Fellow of the Institution of Engineers, Australia, and a Foreign Associate of the US National Academy of Engineering. He holds honorary doctorates from a number of universities, including Université Catholique de Louvain, Belgium, and ETH, Zürich. He is a past president of the International Federation of Automatic Control and the Australian Academy of Science. He served as the first President of NICTA, and was a member of company boards, including Cochlear Ltd, the world’s major supplier of bionic ears, and a member of the Prime Minister’s Science Council under three prime ministers. His current research interests are in distributed control, sensor networks and econometric modelling.