

学术报告会

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Attitude synchronization and reduced attitude formation control

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Abstract:

In this talk we will first discuss full attitude synchronization for a group of agents, then move on to discuss formation control in reduced attitude, which can be identified with the unit sphere. For the attitude synchronization problem, we propose two distributed control laws that under some assumptions on the communication topology will achieve synchronization. For the reduced attitude formation where only relative information is available, without using the desired formation as reference in the control design, we provide a partial but affirmative answer to the following interesting question: is it possible to achieve a desired formation by imposing some proper inter-agent graph to the system and then making that formation asymptotically stable? Formations we can achieve by this way include circles and all Platonic solids.

Biography:

Xiaoming Hu was born in Chengdu, China. He received the B.S. degree from University of Science and Technology of China in 1983. He received the M.S. and PhD degrees from Arizona State University in 1986 and 1989 respectively, under the guidance of Professor Christopher I. Byrnes. He served as a research assistant at the Institute of Automation, the Chinese Academy of Sciences, from 1983 to 1984. From 1989 to 1990 he was a Gustafsson Postdoctoral Fellow at the Royal Institute of Technology, Stockholm, where he is a full professor of Optimization and Systems Theory in the Department of Mathematics since October 2003, and a board member of the Center for Autonomous Systems. He was also a member of the executive committee of ACCESS Linnaeus Centre, established at KTH in 2006 through a ten-year 100 Million SEK grant from the Swedish Research Council. He held an S.S. Chern guest professorship at Nankai University, and is now also a member of the International Research Team on Complex Systems of the Chinese Academy of Sciences.

Xiaoming Hu has led or participated in many research projects sponsored by EU, the Swedish Research Council, the Swedish Strategic Research Foundation, the Swedish Defense Material Administration, and the Swedish National Space Board. His main research interests are in complex and networked systems, active sensing and perception, control of multi-agent systems, nonlinear observer design, and mobile manipulation. He has published more than 170 papers in journals and international conference proceedings. He has been involved in the organization or program committee of many international conferences and is on the editorial board of several journals. In particular, he was one of the initiators of the very successful bilateral conference-Chinese-Swedish Control Conference, which has so-far been held six times in Sweden and China alternately.