数学与系统科学研究院学术报告

报告题目： Formation control for a team of autonomous agents

报 告 人： Dr. Ming CAO (Princeton University)

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摘要:

In this talk, we will discuss two problems that arise in the control of a formation of autonomous agents. The first problem is how to maintain a triangular formation in the plane consisting of three mobile autonomous agents. It is shown that the distributed control law we proposed can cause any initially non-collinear formation to converge exponentially fast to the desired formation. It is also shown that initially collinear formations remain collinear and may drift off to infinity as time t approaches infinity. The second problem is the three landmark station keeping problem in the plane in which range measurements are the only sensed signals upon which station keeping is to be based. A tractable and provably correct solution is given using concepts from switched adaptive control theory plus a special parameterization of the class of 2-by-2 nonsingular matrices. The performance of the overall system degrades gracefully in the face of increasing measurement and miss-alignment errors, provided the measurement errors are not too large.

报告人简介:

Mr. Ming Cao is currently a Postdoctoral Research Associate at the Department of Mechanical and Aerospace Engineering at Princeton University, New Jersey, USA. He received his PhD degree in Electrical Engineering in 2007 from Yale University, Connecticut, USA. His PhD thesis, entitled "Multi-Agent Formations and Sensor Networks", was supervised by Prof. A. Stephen Morse. He received his Master and Bachelor degrees in Electrical Engineering in 2002 and 1999 respectively from Tsinghua University, Beijing, China. He worked as a Research Intern during the summer of 2006 with the Mathematical Sciences Department at IBM T. J. Watson Research Center, New York, USA.