



學術報告

Bearing Rigidity Theory and its Applications for Control and Estimation of Network Systems



报告人: Dr. Shiyu Zhao

Dept. of Automatic Control and Systems Engineering
University of Sheffield, UK

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Biography: Shiyu Zhao is currently a Lecturer in the Department of Automatic Control and Systems Engineering at the University of Sheffield, UK. He received the BEng and MEng degrees from Beijing University of Aeronautics and Astronautics, China. He got the PhD degree in Electrical Engineering from National University of Singapore in 2014. From 2014 to 2016, he served as post-doctoral researchers at the Technion - Israel Institute of Technology and University of California at Riverside, respectively. He is a corecipient of the Best Paper Award in the 33rd Chinese Control Conference, Nanjing, China. His research interests include control and estimation of networked dynamical systems and its application to intelligent and robotic systems.

This talk will introduce my recent research results on distributed control and estimation over robotic networks. I will introduce a new bearing-based approach to solve some problems that used to be difficult to solve by conventional approaches. This bearing-based approach, which was originally motivated by vision-based multi-robot swarming, fully explores the critical role of bearing information in multi-robot control and estimation. With this approach, distributed formation control of multiple robots can be achieved merely based on inter-neighbor bearing measurements while distance information is not required. The bearing-based approach can also be applied to sensor network self-localization with bearing-only measurements and provide a simple solution to control the scale of multi-robot formations to avoid obstacles.