

6th World Convention on

ROBOTS, AUTONOMOUS VEHICLES AND DEEP LEARNING

September 10-11, 2018 Singapore

**Sunan Huang**

Temasek Laboratories-National University of Singapore, Singapore

Distributed collision avoidance control for multi-unmanned aerial vehicles

Currently, cooperative control of a multiple Unmanned Aerial Vehicle (UAV) system is attracting growing interest. This is motivated by growing number of everyday civil and commercial UAV applications. One of the core problems in the multi UAV system is motion planning, where each UAV navigates path to the target by sharing other UAV information. This requires collision-free path during the UAV motion control. Thus, the topic of UAV collision avoidance has driven a development of various control technologies in this area. In this talk, we first review the development of multiple UAV systems and collision avoidance. Therefore, we focus on a distributed collision avoidance algorithm which is proposed in a multi-UAV system. The basic idea is to use the cooperative control concept to generate heartbeat message, where multi-UAV communication is used to exchange UAV information and the fusion technology is used to merge them. With the heartbeat message fused, the own UAV is to select the velocity command to avoid only those UAVs or obstacles which are within a certain range around the own UAV. The velocity obstacle algorithm is adopted for collision avoidance control. This control is in a distributed form and each UAV independently makes its own decision. Finally, in this talk, we will show the flight test of the proposed method implemented on several real UAVs.

Biography

Sunan Huang has completed his PhD degree from Shanghai Jiao Tong University. He was a Postdoctoral Fellow in the Department of Electrical Engineering and Computer Sciences, University of California at Berkeley. He was also a Research Fellow in the Department of Electrical and Computer Engineering, National University of Singapore, a Visiting Professor in Hangzhou Dianzi University. He is currently a Senior Research Scientist in Temasek Laboratories, National University of Singapore. He has co-authored several patents, more than 120 journal papers and four books entitled *Precision Motion Control*, *Modeling and Control of Precise Actuators*, *Applied Predictive Control* and *Neural Network Control: Theory and Applications*. He is also a Member of the Editorial Advisory Board, *Journal of Recent Patents on Engineering*, a Reviewer Editor of *Journal of Frontiers in Robotics and AI* and an Associate Editor of *The Open Electrical and Electronic Engineering Journal*.

tslhs@nus.edu.sg**Notes:**