The 5th International Conference on Robotics and Mechatronics

Workshop on "Cooperative Control in Aerospace Systems"

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Abstract- Aerospace vehicles have been a major part of autonomous systems in recent decades with a wide range of applications for monitoring, reconnaissance, search and rescue missions, radio coverage, and so on. This issue is due to their ability to flight in three dimensions, fast motion, wide line of sight, and high coverage abilities. The main objective of the current workshop is to provide an introduction on control of aerospace vehicles, motivations and applications of aerospace autonomous systems, various classes of aerospace vehicles, cooperative aerospace systems, various missions in cooperative aerospace vehicles, and so on. This workshop will be presented in two main parts. First cooperative control in unmanned air vehicles will be considered. In general, in the view of mechanical structure and challenges existing in control system design, unmanned air vehicles can be categorized in two classes namely fixed wing aircraft and rotary wing aircraft each of which has its own advantages and complexities. Considering the mentioned classification, the first part of the workshop is devoted to

-Applications and motivation of unmanned air vehicles
-Various class of unmanned air vehicles
-Various cooperative control approaches/structures
-Various cooperative missions in unmanned air vehicles
-Robust and adaptive cooperative control
-Cooperation in the presence of communication uncertainties

In the second part, cooperative multispacecraft systems in formation flight will be considered. Cooperative control of multispacecraft systems can be studied in two levels, namely orbital level and attitude level. In the first level, coordination of spacecraft to achieve formation on the Earth orbits is considered, and in the second level, alignment of spacecraft attitude with a common value is an important issue. Based on the mentioned cooperation levels, this part of the workshop is devoted to

-Attitude alignment with and without reference attitudes
-Attitude alignment with magnetic actuators
-Robust and adaptive attitude alignment
-Attitude alignment in the presence of communication uncertainties
-Orbital correction to achieve formation

Authors' Biography:

Farzaneh Abdollahi received the B.Sc. degree in electrical engineering from Isfahan University of Technology, Isfahan, Iran, in 1999, the M.Sc. degree in electrical engineering from Amirkabir University of Technology, Tehran, Iran, in 2003, and the Ph.D. degree in electrical engineering from Concordia University, Montreal, QC, Canada, in 2008. She is currently an Assistant Professor with Amirkabir University of Technology and a Research Assistant Professor with Concordia University. Her research interests include neural networks, robotics, control of nonlinear systems, control of multiagent networks, and robust and switching control.

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