

COLLEGE OF ENGINEERING

Control Seminar



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Dynamic Coverage and Semi-Cooperative Coordination in Multi-Agent Systems



Dimitra Panagou

University of Michigan
Department of Aerospace Engineering

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3:30 – 4:30 pm • 1500 EECS

ABSTRACT: Control of multi-agent systems is a popular topic of research with applications, among others, in surveillance and environmental monitoring using autonomous vehicles. Planning, coordination and control for such systems and missions is challenging due to the agents' dynamics, restrictions in their onboard power, sensing, communication and computation capabilities, the number of agents in the network, and uncertainty about the environment. In this talk we will present some of our recent results on dynamic energy-aware coverage control, and on the distributed semi-cooperative motion planning and coordination for agents belonging to different classes. The derived feedback control protocols achieve (i) 3D dynamic redeployment and data gathering while taking into account the constrained energy resources of the agents, and (ii) on-the-fly prioritization among agents that takes into account their different tasks and capabilities (sensing, communication), favors fewer deviations from nominal flight routes, and preserves safety with not all agents participating in conflict resolution and collision avoidance.

BIO: Dimitra Panagou received the Diploma and PhD degrees in Mechanical Engineering from the National Technical University of Athens, Greece, in 2006 and 2012, respectively. Since September 2014 she has been an Assistant Professor with the Department of Aerospace Engineering, University of Michigan. Prior to joining the University of Michigan, she was a postdoctoral research associate with the Coordinated Science Laboratory, University of Illinois, Urbana-Champaign (2012-2014), a visiting research scholar with the GRASP Lab, University of Pennsylvania (June 2013, fall 2010) and a visiting research scholar with the University of Delaware, Mechanical Engineering Department (spring 2009). Her research interests include the fields of planning, coordination and distributed control of complex systems, with applications in unmanned aerial systems, robotic networks and autonomous multi-vehicle systems (ground, marine, aerial, space). She is a recipient of a NASA Early Faculty Career Award, of an AFOSR Young Investigator Award, and member of the IEEE and the AIAA.