

Cooperative Control, Optimization and Information Flow

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Abstract

Over the past decade, rapid progress in optimization-based estimation and control combined with advances in real-time networking and computation have led to new approaches in integrated guidance, navigation and autonomy for both single and multiple vehicle systems.

In this talk we survey some of recent research in cooperative control of multi-vehicle systems, using a common mathematical framework to allow different methods to be described in a unified way. We then focus on a few key technical areas in which there has been significant progress with the possibilities of changing the way we design modern aerospace systems: real-time spatio-temporal planning, networked control systems, and the role of topology in stability and performance of cooperative systems.