Tamas Keviczky

Decentralized Receding Horizon Control

For Large-scale Dynamically Decoupled Systems



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Huge networks of interconnected, independently actuated systems are available these times in a broad spectrum of applications ranging from robotics and formation air travel to civil engineering. Stability of the proposed scheme is usually analyzed at length and a number of methodologies are provided to address the problem of feasibility. The technique is illustrated by developing distributed formation control laws and regulations for cooperative Unmanned Air Automobiles (UAVs). The abundance and importance of these systems will continue steadily to grow along with the requirement of avoiding centralized control design when it becomes computationally prohibitive or needs unrealistic expectations regarding information exchange. This reserve proposes a decentralized ideal control framework using distributed Receding Horizon Control (RHC) schemes to address this issue, which helps overcome drawbacks of currently available methods. The presented tools and analysis ought to be especially useful for systems and controls engineers/experts studying constrained optimal control using localized info, or other people who may be thinking about working with large-scale systems and autonomous vehicle-teams.



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