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Altri autori (Persone)	ShammaJeff S
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Nota di contenuto	Cooperative Control of Distributed Multi-Agent Systems; Contents; List of Contributors; Preface; Part I Introduction; 1 Dimensions of cooperative control; 1.1 Why cooperative control?; 1.1.1 Motivation; 1.1.2 Illustrative example: command and control of networked vehicles; 1.2 Dimensions of cooperative control; 1.2.1 Distributed control and computation; 1.2.2 Adversarial interactions; 1.2.3 Uncertain evolution; 1.2.4 Complexity management; 1.3 Future directions; Acknowledgements; References; Part II Distributed Control and Computation 2 Design of behavior of swarms: From flocking to data fusion using microfilter networks2.1 Introduction; 2.2 Consensus problems; 2.3 Flocking behavior for distributed coverage; 2.3.1 Collective potential of flocks; 2.3.2 Distributed flocking algorithms; 2.3.3 Stability analysis for flocking motion; 2.3.4 Simulations of flocking; 2.4 Microfilter networks for cooperative data fusion; Acknowledgements; References; 3

Connectivity and convergence of formations; 3.1 Introduction; 3.2 Problem formulation; 3.3 Algebraic graph theory
3.4 Stability of vehicle formations in the case of time-invariant communication3.4.1 Formation hierarchy; 3.5 Stability of vehicle formations in the case of time-variant communication; 3.6 Stabilizing feedback for the time-variant communication case; 3.7 Graph connectivity and stability of vehicle formations; 3.8 Conclusion; Acknowledgements; References; 4 Distributed receding horizon control: stability via move suppression; 4.1 Introduction; 4.2 System description and objective; 4.3 Distributed receding horizon control; 4.4 Feasibility and stability analysis; 4.5 Conclusion; Acknowledgement References5 Distributed predictive control: synthesis, stability and feasibility; 5.1 Introduction; 5.2 Problem formulation; 5.3 Distributed MPC scheme; 5.4 DMPC stability analysis; 5.4.1 Individual value functions as Lyapunov functions; 5.4.2 Generalization to arbitrary number of nodes and graph; 5.4.3 Exchange of information; 5.4.4 Stability analysis for heterogeneous unconstrained LTI subsystems; 5.5 Distributed design for identical unconstrained LTI subsystems; 5.5.1 LQR properties for dynamically decoupled systems; 5.5.2 Distributed LQR design; 5.6 Ensuring feasibility
5.6.1 Robust constraint fulfillment5.6.2 Review of methodologies; 5.7 Conclusion; References; 6 Task assignment for mobile agents; 6.1 Introduction; 6.2 Background; 6.2.1 Primal and dual problems; 6.2.2 Auction algorithm; 6.3 Problem statement; 6.3.1 Feasible and optimal vehicle trajectories; 6.3.2 Benefit functions; 6.4 Assignment algorithm and results; 6.4.1 Assumptions; 6.4.2 Motion control for a distributed auction; 6.4.3 Assignment algorithm termination; 6.4.4 Optimality bounds; 6.4.5 Early task completion; 6.5 Simulations; 6.5.1 Effects of delays; 6.5.2 Effects of bidding increment
6.5.3 Early task completions

Sommario/riassunto

The paradigm of 'multi-agent' cooperative control is the challenge frontier for new control system application domains, and as a research area it has experienced a considerable increase in activity in recent years. This volume, the result of a UCLA collaborative project with Caltech, Cornell and MIT, presents cutting edge results in terms of the "dimensions" of cooperative control from leading researchers worldwide. This dimensional decomposition allows the reader to assess the multi-faceted landscape of cooperative control. Cooperative Control of Distributed Multi-Agent Systems is organized