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Nota di contenuto	Introduction -- 1. Complexity Certifications of First Order Inexact Lagrangian Methods for General Convex Programming: Application to Real-time MPC -- 2. Fully Inverse Parametric Linear/Quadratic Programming Problems via Convex Liftings -- 3. Implications of Inverse Parametric Optimization in Model Predictive Control -- 4. Distributed Robust Model Predictive Control of Interconnected Polytopic Systems -- 5. Optimal Distributed-Coordinated Approach for Energy Management in Multisource Electric Power Generation Systems -- 6. Evolutionary-game-based Dynamical Tuning for Multi-objective Model Predictive Control -- 7. A Model Predictive Control-based Architecture for Cooperative Path-following of Multiple Unmanned Aerial Vehicles -- 8. Predictive Control for Path Following. From Trajectory Generation to the Parameterization of the Discrete Tracking Sequences -- 9. Formation Reconfiguration using Model Predictive Control Techniques for Multi-Agent Dynamical Systems -- 10. Optimal Operation of a Lumostatic Microalgae Cultivation Process -- 11. Bioprocesses Parameter

Estimation by Heuristic Optimization Techniques -- 12. Real-time Experimental Implementation of Predictive Control Schemes in a Small-scale Pasteurization Plant -- 13. An Optimization-based Framework for Impulsive Control Systems -- 14. Robustness Issues in Control of Bilinear Discrete-Time Systems - Applied to the Control of Power Converters -- 15. On the LPV Control Design and its Applications to Some Classes of Dynamical Systems -- 16. Ultimate Bounds and Robust Invariant Sets for Linear Systems with State-dependent Disturbances -- 17. RPI Approximations of the mRPI Set Characterizing Linear Dynamics with Zonotopic Disturbances. .

Sommario/riassunto

This book deals with optimization methods as tools for decision making and control in the presence of model uncertainty. It is oriented to the use of these tools in engineering, specifically in automatic control design with all its components: analysis of dynamical systems, identification problems, and feedback control design. Developments in Model-Based Optimization and Control takes advantage of optimization-based formulations for such classical feedback design objectives as stability, performance and feasibility, afforded by the established body of results and methodologies constituting optimal control theory. It makes particular use of the popular formulation known as predictive control or receding-horizon optimization. The individual contributions in this volume are wide-ranging in subject matter but coordinated within a five-part structure covering material on: · complexity and structure in model predictive control (MPC); · collaborative MPC; · distributed MPC; · optimization-based analysis and design; and · applications to bioprocesses, multivehicle systems or energy management. The various contributions cover a subject spectrum including inverse optimality and more modern decentralized and cooperative formulations of receding-horizon optimal control. Readers will find fourteen chapters dedicated to optimization-based tools for robustness analysis, and decision-making in relation to feedback mechanisms—fault detection, for example—and three chapters putting forward applications where the model-based optimization brings a novel perspective. Developments in Model-Based Optimization and Control is a selection of contributions expanded and updated from the Optimisation-based Control and Estimation workshops held in November 2013 and November 2014. It forms a useful resource for academic researchers and graduate students interested in the state of the art in predictive control. Control engineers working in model-based optimization and control, particularly in its bioprocess applications will also find this collection instructive.