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Nota di contenuto	1.Optimality conditions (in Pontryagin form) -- 1.1 Introduction -- 1.2 -- On first order necessary conditions under pure state constraints -- 1.3 Optimality conditions and local regularity of the value function for the optimal exit time problem -- 1.4 Relaxation in Optimal Control -- 1.5 An Introduction to Optimal Control Problems with Time Delays -- 1.6 Variational Integrators for the Optimal Control of Mechanical Systems -- 1.7 Pointwise necessary second order conditions -- 1.8 On the shooting method for control-affine problems -- 1.9 On second order conditions in the optimal control of Partial Differential Equations -- 2.Hamilton–Jacobi–Bellman equations -- 2.1 Introduction -- 2.2 Hamilton-Jacobi-Bellman approach for State-Constrained Optimal Control Problems, by Cristopher Hermosilla and Athena Picarelli -- 2.3 Hamilton-Jacobi-Bellman approach for State-Constrained Optimal Control Problems -- 2.4 High-order schemes for Hamilton–Jacobi–Bellman equations -- 2.5 Conclusion -- 2.6 Some Recent Applications of Hamilton–Jacobi–Bellman equations -- 2.7 A Brief Survey on Semi-Lagrangian Schemes for Mean Field Games, by

Roberto Guglielmi and Francisco Silva -- 3. Direct Optimal Control and Model Predictive Control -- 3.1 Introduction -- 3.2 MPC Stability -- 3.3 Numerical Methods for MPC -- 3.4 Applications.

Sommario/riassunto

Focusing on applications to science and engineering, this book presents the results of the ITN-FP7 SADCO network's innovative research in optimization and control in the following interconnected topics: optimality conditions in optimal control, dynamic programming approaches to optimal feedback synthesis and reachability analysis, and computational developments in model predictive control. The novelty of the book resides in the fact that it has been developed by early career researchers, providing a good balance between clarity and scientific rigor. Each chapter features an introduction addressed to PhD students and some original contributions aimed at specialist researchers. Requiring only a graduate mathematical background, the book is self-contained. It will be of particular interest to graduate and advanced undergraduate students, industrial practitioners and to senior scientists wishing to update their knowledge.