

1. Record Nr.	UNINA9910299973803321
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Titolo	Dynamics and Control of Trajectory Tubes : Theory and Computation / / by Alexander B. Kurzhanski, Pravin Varaiya
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Birkhäuser, , 2014
ISBN	3-319-10277-X
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (457 p.)
Collana	Systems & Control: Foundations & Applications, , 2324-9749 ; ; 85
Disciplina	671.832
Soggetti	Calculus of variations Automatic control Convex geometry Discrete geometry K-theory Calculus of Variations and Optimal Control; Optimization Control and Systems Theory Convex and Discrete Geometry K-Theory
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Preface -- 1. Linear Control Systems -- 2. The Dynamic Programming Approach -- 3. Ellipsoidal Techniques: Reachability and Control Synthesis -- 4. Solution Examples on Ellipsoidal Methods: Computation in High Dimensions -- 5. The Comparison Principle: Nonlinearity and Nonconvexity -- 6. Impulse Control and Double Constraints -- 7. Dynamics and Control under State Constraints -- 8. Trajectory Tubes: State-Constrained Feedback Control -- 9. Guaranteed State Estimation -- 10. Uncertain Systems: Output Feedback Control -- 11. Verification: Hybrid Systems.
Sommario/riassunto	This monograph presents theoretical methods involving the Hamilton–Jacobi–Bellman formalism in conjunction with set-valued techniques of nonlinear analysis to solve significant problems in dynamics and control. The emphasis is on issues of reachability, feedback control synthesis under complex state constraints, hard or double

bounds on controls, and performance in finite time. Guaranteed state estimation, output feedback control, and hybrid dynamics are also discussed. Although the focus is on systems with linear structure, the authors indicate how to apply each approach to nonlinear and nonconvex systems. The main theoretical results lead to computational schemes based on extensions of ellipsoidal calculus that provide complete solutions to the problems. These computational schemes in turn yield software tools that can be applied effectively to high-dimensional systems. *Dynamics and Control of Trajectory Tubes: Theory and Computation* will interest graduate and senior undergraduate students, as well as researchers and practitioners interested in control theory, its applications, and its computational realizations.
