

1. Record Nr.	UNINA9910866567103321
Autore	Yuksel Serdar
Titolo	Stochastic Teams, Games, and Control under Information Constraints / / by Serdar Yüksel, Tamer Baar
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Birkhäuser, , 2024
ISBN	9783031540714 9783031540707
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (935 pages)
Collana	Systems & Control: Foundations & Applications, , 2324-9757
Altri autori (Persone)	BasarTamer
Disciplina	003
Soggetti	System theory Control theory Game theory Coding theory Information theory Automatic control Systems Theory, Control Game Theory Coding and Information Theory Control and Systems Theory
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Part I: Stochastic Teams and a Mathematical Theory of Information Structures -- An Introduction to Stochastic Team Theory and Solutions to Static Teams -- Information Structures in Decentralized Stochastic Control -- Existence, Structure, and Approximations to Optimality: Strategic Measures in Decentralized Stochastic Control -- Control Policy Topologies and Dynamic Programming Methods in Decentralized Stochastic Control -- Many-Agent Convex and Non-Convex Exchangeable (Mean-Field) Teams and Optimality of Symmetric Policies -- Comparison of Information Structures and Their Blackwell Ordering -- Continuity, Existence, and Topological Properties of Optimal Cost on the Space of Information Structures -- Part II: Stochastic Game Theory and Information

Structures -- An Introduction to Stochastic Game Theory -- Information Structures in Stochastic Dynamic Games, Equilibrium Concepts, and Informational Properties -- Information Structure Dependent Properties: Existence, Comparison, Continuity of Equilibria and Team-against-Team Games -- Part III: Information Design via Information Theory in Networked Systems and Control -- Coding for Control and Connections with Information Theory -- Stochastic Stabilization of Linear Systems under Information Constraints -- Stochastic Stabilization of Non-Linear Systems: Information Theoretic versus Stochastic Geometric Analysis -- Optimal Real-Time Coding and Control under Information Constraints: Structural and Existence Results -- Optimal LQG Coding and Control: Separation Results, Information Theoretic Methods, and Optimality of Linear Policies -- Optimal Coding under Small Estimation Error and Observability Criteria -- Part IV: Information and Signaling Games -- Signaling Games: Equilibria under Misaligned Criteria or Mismatched Priors between an Encoder and a Decoder -- Two Classes of Signaling Games: Reputation and Information Privacy Games -- Zero-Sum Information Games: Jamming and Witsenhausen's Counterexample as a Game -- Appendix A: Topological Notions and Optimizations -- Appendix B: Probability Theory and Stochastic Processes -- Appendix C: On Spaces of Probability Measures -- Appendix D: Markov Chains, Martingales, and Ergodic Processes -- Appendix E: Markov Decision Theory and Optimality of Markov Policies -- Appendix F: Stochastic Stability of Markov Chains and Random-Time State-Dependent Stochastic Drift -- Appendix G: Topological and Metric Entropy in Dynamical Systems.

Sommario/riassunto

This monograph presents a mathematically rigorous and accessible treatment of the interaction between information, decision, control, and probability in single-agent and multi-agent systems. The book provides a comprehensive and unified theory of information structures for stochastic control, stochastic teams, stochastic games, and networked control systems. Part I of the text is concerned with a general mathematical theory of information structures for stochastic teams, leading to systematic characterizations and classifications, geometric and topological properties, implications on existence, approximations and relaxations, their comparison, and regularity of optimal solutions in information. Information structures in stochastic games are then considered in Part II, and the dependence of equilibrium solutions and behavior on information is demonstrated. Part III studies information design through information theory in networked control systems – both linear and nonlinear – and discusses optimality and stability criteria. Finally, Part IV introduces information and signaling games under several solution concepts, with applications to prior mismatch, cost mismatch and privacy, reputation games and jamming. This text will be a valuable resource for researchers and graduate students interested in control theory, information theory, statistics, game theory, and applied mathematics. Readers should be familiar with the basics of linear systems theory, stochastic processes, and Markov chains.
