

1. Record Nr.	UNINA9910957364603321
Autore	Filar Jerzy
Titolo	Competitive Markov Decision Processes // by Jerzy Filar, Koos Vrieze
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 1997
ISBN	1-4612-4054-9
Edizione	[1st ed. 1997.]
Descrizione fisica	1 online resource (XII, 394 p.)
Disciplina	519.5/42
Soggetti	Operations research Engineering mathematics Engineering - Data processing Automatic control Robotics Automation Operations Research and Decision Theory Mathematical and Computational Engineering Applications Control, Robotics, Automation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"With 57 illustrations."
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1 Introduction -- 1.0 Background -- 1.1 Raison d'Etre and Limitations -- 1.2 A Menu of Courses and Prerequisites -- 1.3 For the Cognoscenti -- 1.4 Style and Nomenclature -- I Mathematical Programming Perspective -- 2 Markov Decision Processes: The Noncompetitive Case -- 3 Stochastic Games via Mathematical Programming -- II Existence, Structure and Applications -- 4 Summable Stochastic Games -- 5 Average Reward Stochastic Games -- 6 Applications and Special Classes of Stochastic Games -- Appendix G Matrix and Bimatrix Games and Mathematical Programming -- G.1 Introduction -- G.2 Matrix Game -- G.3 Linear Programming -- G.4 Bimatrix Games -- G.5 Mangasarian-Stone Algorithm for Bimatrix Games -- G.6 Bibliographic Notes -- Appendix H A Theorem of Hardy and Littlewood -- H.1 Introduction -- H.2 Preliminaries, Results and Examples -- H.3 Proof of the Hardy-Littlewood Theorem -- Appendix M Markov Chains -- M.1 Introduction -- M.2 Stochastic Matrix -- M.3 Invariant Distribution --

M.4 Limit Discounting -- M.5 The Fundamental Matrix -- M.6
Bibliographic Notes -- Appendix P Complex Varieties and the Limit
Discount Equation -- P.1 Background -- P.2 Limit Discount Equation as
a Set of Simultaneous Polynomials -- P.3 Algebraic and Analytic
Varieties -- P.4 Solution of the Limit Discount Equation via Analytic
Varieties -- References.

Sommario/riassunto

This book is intended as a text covering the central concepts and techniques of Competitive Markov Decision Processes. It is an attempt to present a rigorous treatment that combines two significant research topics: Stochastic Games and Markov Decision Processes, which have been studied extensively, and at times quite independently, by mathematicians, operations researchers, engineers, and economists. Since Markov decision processes can be viewed as a special noncompetitive case of stochastic games, we introduce the new terminology Competitive Markov Decision Processes that emphasizes the importance of the link between these two topics and of the properties of the underlying Markov processes. The book is designed to be used either in a classroom or for self-study by a mathematically mature reader. In the Introduction (Chapter 1) we outline a number of advanced undergraduate and graduate courses for which this book could usefully serve as a text. A characteristic feature of competitive Markov decision processes - and one that inspired our long-standing interest - is that they can serve as an "orchestra" containing the "instruments" of much of modern applied (and at times even pure) mathematics. They constitute a topic where the instruments of linear algebra, applied probability, mathematical programming, analysis, and even algebraic geometry can be "played" sometimes solo and sometimes in harmony to produce either beautifully simple or equally beautiful, but baroque, melodies, that is, theorems.
