



Dynamic Programming & Optimal Control, Vol. I

By Dimitri P. Bertsekas

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The first of the two volumes of the leading and most up-to-date textbook on the far-ranging algorithmic methodology of Dynamic Programming, which can be used for optimal control, Markovian decision problems, planning and sequential decision making under uncertainty, and discrete/combinatorial optimization. The treatment focuses on basic unifying themes, and conceptual foundations. It illustrates the versatility, power, and generality of the method with many examples and applications from engineering, operations research, and other fields. It also addresses extensively the practical application of the methodology, possibly through the use of approximations, and provides an introduction to the far-reaching methodology of Neuro-Dynamic Programming. The first volume is oriented towards modeling, conceptualization, and finite-horizon problems, but also includes a substantive introduction to infinite horizon problems that is suitable for classroom use. The second volume is oriented towards mathematical analysis and computation, and treats infinite horizon problems extensively. The text contains many illustrations, worked-out examples, and exercises.

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Review

In this two-volume work Bertsekas caters equally effectively to theoreticians who care for proof of such concepts as the existence and the nature of optimal policies and to practitioners interested in the modeling and the quantitative and numerical solution aspects of stochastic dynamic programming. --Michael Caramanis, in Interfaces

In conclusion, this book is an excellent source of reference ... The main strengths of the book are the clarity of the exposition, the quality and variety of the examples, and its coverage of the most recent advances. --Thomas W. Archibald, in IMA Jnl. of Mathematics Applied in Business & Industry

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About the Author

The author s McAfee Professor of Engineering at the Massachusetts Institute of Technology and a member of the prestigious United States National Academy of Engineering. He is the recipient of the 2001 A. R. Raggazini AACC education award, the 2009 INFORMS expository writing award, the 2014 Kachiyon Prize, and the 2014 AACC Bellman Heritage Award. He has been teaching the material included in this book in introductory graduate courses for over thirty years.

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