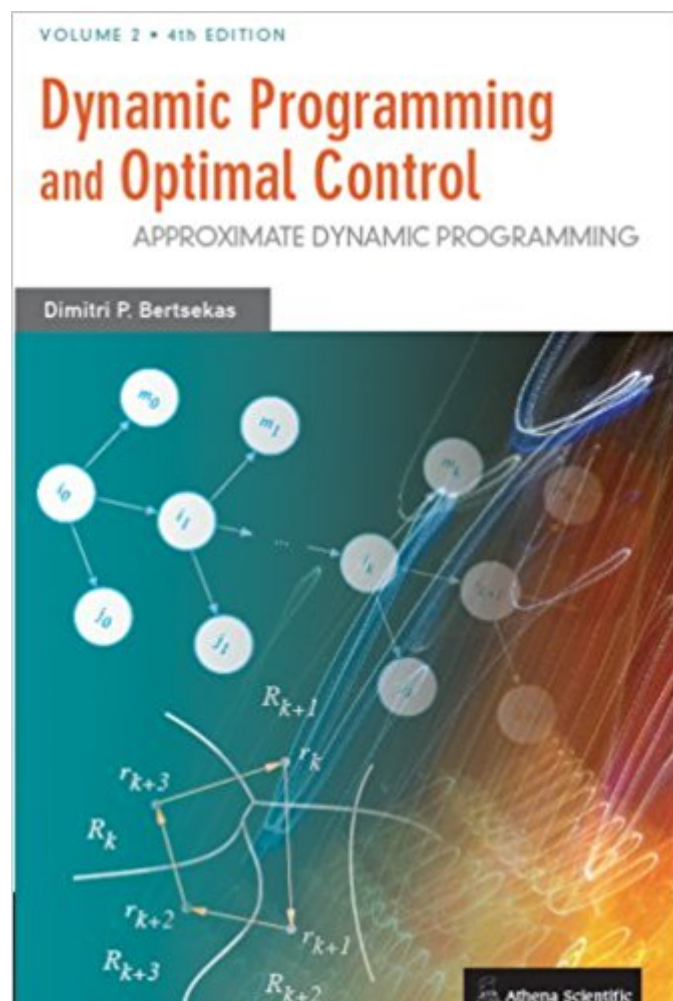**The book was found**

Dynamic Programming And Optimal Control, Vol. II, 4th Edition: Approximate Dynamic Programming

Synopsis

This 4th edition is a major revision of Vol. II of the leading two-volume dynamic programming textbook by Bertsekas, and contains a substantial amount of new material, as well as a reorganization of old material. The length has increased by more than 60% from the third edition, andmost of the old material has been restructured and/or revised. Volume II now numbers more than 700 pages and is larger in size than Vol. I. It can arguably be viewed as a new book! Approximate DP has become the central focal point of Vol. II, and occupies more than half of the book (the last two chapters, and large parts of Chapters 1-3). Thus one may also view Vol. II as a followup of the author's 1996 book ``Neuro-Dynamic Programming" (coauthored with John Tsitsiklis). The present book focuses to a great extenton new research that became available after 1996. On the other hand, the textbook style of the book has been preserved, and some material has been explained at an intuitive or informal level, while referring to the journal literature or the Neuro-Dynamic Programming book for a more mathematical treatment.As the book's focus shifted, increased emphasis was placed on new or recent research in approximate DP and simulation-based methods, as well as on asynchronous iterative methods, in view of the central role of simulation, which is by nature asynchronous. A lot of this material is an outgrowth of research conducted in the six years since the previous edition. Some of the highlights, in the order appearing in the book, are:(a) A broad spectrum of simulation-based, approximate value iteration, policy iteration, and Q-learning methods based on projected equations and aggregation.(b) New policy iteration and Q-learning algorithms for stochastic shortest path problems with improper policies. (c) Reliable Q-learning algorithms for optimistic policy iteration.(d) New simulation techniques for multistep methods, such as geometric and free-form sampling, based on generalized weighted Bellman equations. (e) Computational methods for generalized/abstract discounted DP, including convergence analysis and error bounds for approximations.(f) Monte Carlo linear algebra methods, which extend the approximate DP methodology to broadly applicable problems involving large-scale regression and systems of linear equations. The book includes a substantial number of examples, and exercises, detailed solutions of many of which are posted on the internet. It was developed through teaching graduate courses at M.I.T., and is supported by a large amount of educational material, such as slides and videos, posted at the MIT Open Courseware, the author's, and the publisher's web sites. Contents: 1. Discounted Problems - Theory. 2. Discounted Problems - Computational Methods. 3.Stochastic Shortest Path Problems. 4. Undiscounted Problems. 5. Average Cost per Stage Problems. 6. Approximate Dynamic Programming - Discounted Models. 7. Approximate Dynamic Programming - Nondiscounted Models and Generalizations.

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Customer Reviews

Review of Vols. I and II, 3rd Edition:In conclusion, the new edition represents a major upgrade of this well-established book. The coverage is significantly expanded, refined, and brought up-to-date. This is the only book presenting many of the research developments of the last 10 years in approximate DP/neuro-dynamic programming/reinforcement learning (the monographs by Bertsekas and Tsitsiklis, and by Sutton and Barto, were published in 1996 and 1998, respectively). The book is a rigorous yet highly readable and comprehensive source on all aspects relevant to DP: applications, algorithms, mathematical aspects, approximations, as well as recent research. It should be viewed as the principal DP textbook and reference work at present. With its rich mixture of theory and applications, its many examples and exercises, its unified treatment of the subject, and its polished presentation style, it is eminently suited for classroom use or self-study. --Panos Pardalos, in Optimization Methods & Software Journal, 2007

Dimitri P. Bertsekas is 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 Kachiyan Prize, the 2014 AACC Bellman Heritage Award, and the 2015 Dantzig Prize.

I thought I had reviewed this book, but perhaps it was done for an earlier edition. Anyway, this is one of my favorite books on Dynamic Programming (DP). Especially if you are interested in stochastic Markov Decision Processes (MDPs), this is the book for you! And this volume covers details of the stochastic MDP. (The other (first) volume covers for the most part linear systems, finite horizon, deterministic control, HJB equations etc.)Topics covered in great detail in this volume include:* Infinite horizon discounted reward (cost) MDPs* Infinite horizon average reward (cost) MDPs* The stochastic shortest path problem (SSPP) of which the finite horizon undiscounted MDP is a special case* Continuous-time MDPs and semi-MDPs (SMDPs)Plus, the new edition contains significant material on Approximate DP (ADP), including material on Q-Learning, approximate policy iteration, the projected Bellman equation methods, function approximation etc. The book does a very solid job of presenting the theory underlying MDPs, which is essential for those who want to use these ideas in their own work or take off from here with their own ideas.Mathematical proofs of existence of optimal solutions for many problems as well convergence proofs of many algorithms are presented. The notation is user friendly and proofs are easy to understand. If you are working in dynamic programming/reinforcement learning, the book will be of great value to you. Overall, it provides a comprehensive and up-to-date description of this rapidly evolving field.

This is an excellent textbook on dynamic programming written by a master expositor. Between this and the first volume, there is an amazing diversity of ideas presented in a unified and accessible manner. This new edition offers an expanded treatment of approximate dynamic programming, synthesizing a substantial and growing research literature on the topic.

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