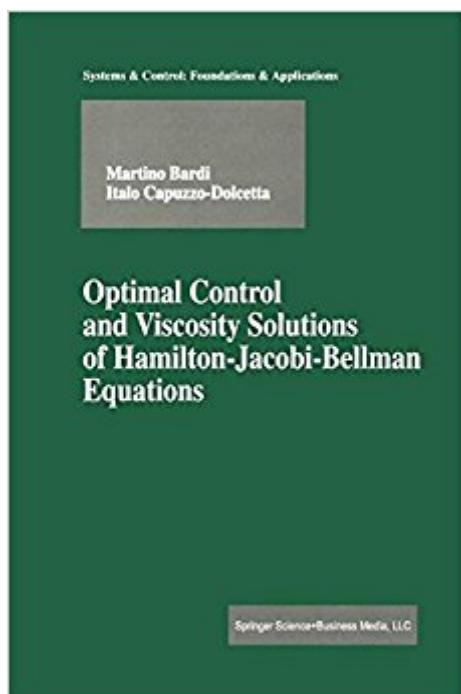


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Optimal Control And Viscosity Solutions Of Hamilton-Jacobi-Bellman Equations (Modern Birkhäuser Classics)



Synopsis

This softcover book is a self-contained account of the theory of viscosity solutions for first-order partial differential equations of Hamilton-Jacobi type and its interplay with Bellman's dynamic programming approach to optimal control and differential games. It will be of interest to scientists involved in the theory of optimal control of deterministic linear and nonlinear systems. The work may be used by graduate students and researchers in control theory both as an introductory textbook and as an up-to-date reference book.

Book Information

Series: Modern Birkhäuser Classics

Paperback: 574 pages

Publisher: Birkhäuser (January 11, 2008)

Language: English

ISBN-10: 0817647546

ISBN-13: 978-0817647544

Product Dimensions: 6.1 x 1.4 x 9.2 inches

Shipping Weight: 2.2 pounds (View shipping rates and policies)

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detailed and clear proofs, the elegant style of presentation, and the sets of proposed exercises at the end of each section recommend this book, in the first place, as a lecture course for graduate students and as a manual for beginners in the field. However, this status is largely extended by the presence of many advanced topics and results by the fairly comprehensive and up-to-date bibliography and, particularly, by the very pertinent historical and bibliographical comments at the end of each chapter. In my opinion, this book is yet another remarkable outcome of the brilliant Italian School of Mathematics." *Zentralblatt MATH* "The book is based on some lecture notes taught by the authors at several universities...and selected parts of it can be used for graduate courses in optimal control. But it can be also used as a reference text for researchers (mathematicians and engineers)... In writing this book, the authors lend a great service to the mathematical community providing an accessible and rigorous treatment of a difficult subject." *Acta Applicandae Mathematicae* "The book originated from the lecture notes of courses taught by the authors, which is reflected in the style of presentation. Each chapter is enriched with a section of bibliographical and historical notes. The book can be recommended to specialists in PDEs, control theory, differential games, and related topics." *Mathematica Bohemica* "As an outgrowth of lecture notes, this monograph purports to introduce and pursue the concept of viscosity solutions of the Hamilton-Jacobi-Bellman equations. It does so requiring but a relative modicum of mathematical knowledge... The book is written in a largely self-contained manner. In addition to bibliographical notes, exercises are provided as well." *Monatshefte für Mathematik* "With an excellent printing and clear structure (including an extensive subject and symbol registry) the book offers a deep insight into the praxis and theory of optimal control for the mathematically skilled reader. All sections close with suggestions for exercises exciting to self control and active collaboration. Finally, with more than 500 cited references, an overview on the history and the main works of this modern mathematical discipline is given." *ZAA*

This book is a self-contained account of the theory of viscosity solutions for first-order partial differential equations of Hamilton-Jacobi type and its interplay with Bellman's dynamic programming approach to optimal control and differential games, as it developed after the beginning of the 1980s with the pioneering work of M. Crandall and P.L. Lions. The book will be of interest to scientists involved in the theory of optimal control of deterministic linear and nonlinear systems. In particular, it will appeal to system theorists wishing to learn about a mathematical theory providing a correct framework for the classical method of dynamic programming as well as mathematicians interested in new methods for first-order nonlinear PDEs. The work may be used by graduate

students and researchers in control theory both as an introductory textbook and as an up-to-date reference book. "The exposition is self-contained, clearly written and mathematically precise. The exercises and open problems will stimulate research in the field. The rich bibliography (over 530 titles) and the historical notes provide a useful guide to the area." • Mathematical Reviews "With an excellent printing and clear structure (including an extensive subject and symbol registry) the book offers a deep insight into the praxis and theory of optimal control for the mathematically skilled reader. All sections close with suggestions for exercises. Finally, with more than 500 cited references, an overview on the history and the main works of this modern mathematical discipline is given." • ZAA "The minimal mathematical background...the detailed and clear proofs, the elegant style of presentation, and the sets of proposed exercises at the end of each section recommend this book, in the first place, as a lecture course for graduate students and as a manual for beginners in the field. However, this status is largely extended by the presence of many advanced topics and results by the fairly comprehensive and up-to-date bibliography and, particularly, by the very pertinent historical and bibliographical comments at the end of each chapter. In my opinion, this book is yet another remarkable outcome of the brilliant Italian School of Mathematics." • Zentralblatt MATH "The book is based on some lecture notes taught by the authors at several universities...and selected parts of it can be used for graduate courses in optimal control. But it can be also used as a reference text for researchers (mathematicians and engineers)...In writing this book, the authors lend a great service to the mathematical community providing an accessible and rigorous treatment of a difficult subject." • Acta Applicandae Mathematicae

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