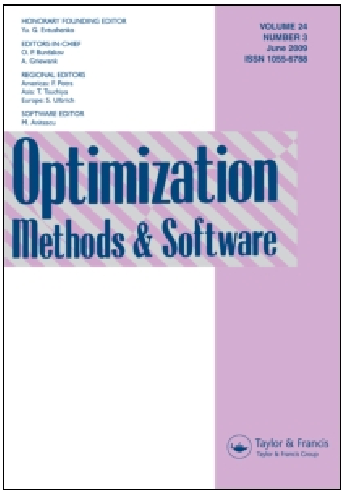

Optimization Methods and Software
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713645924

Convex optimization theory

Panos M. Pardalos [a]
[a] ISE Department, Center for Applied Optimization, Gainesville, FL, USA

Online publication date: 24 February 2010

To cite this Article Pardalos, Panos M.(2010) 'Convex optimization theory', Optimization Methods and Software, 25: 3, 487
To link to this Article: DOI: 10.1080/10556781003625177
URL: http://dx.doi.org/10.1080/10556781003625177

Optimization Methods & Software
Vol. 25, No. 3, June 2010, 487

Book review

Convex optimization theory, by Dimitri P. Bertsekas, Athena Scientific, June 2009, 256 pp., $59.00 (hardcover), ISBN: 1-886529-31-0, 978-1-886529-31-1

The textbook, *Convex Optimization Theory* (Athena) by Dimitri Bertsekas, provides a concise, well-organized, and rigorous development of convex analysis and convex optimization theory. Several texts have appeared recently on these subjects, most of which, like the Bertsekas book, follow the formalism of the classic book by Rockafellar (Princeton University Press, 1970), but aim at an up-to-date treatment that includes major recent algorithmic developments. The text by Bertsekas is by far the most geometrically oriented of these books. It relies on visualization to explain complex concepts at an intuitive level and to guide mathematical proofs. Nearly, all the analysis in the book is geometrically motivated, and the emphasis is on rigorous, polished, and economical arguments, which tend to reinforce the geometric intuition.

Besides the development of the basic tools of convex analysis (conjugate functions, recession cones, subgradients, polyhedral convexity, theorems of the alternative, etc.), the book focuses on duality theory. A unique feature of this book is that strong duality theorems and existence of dual-optimal solution results are first developed within a unifying geometrically transparent framework and are then specialized to constrained optimization, minimax theory, and other contexts. Convex optimization algorithms are covered in a 150-page supplementary web-based chapter, which, according to the author, will be periodically updated to reflect new research developments. The book's website also contains many exercises that extend the coverage of the printed text. The book was developed through classroom instruction and is eminently useful for a theoretical one-quarter or one-semester theoretical course on convex analysis and optimization. It is also very well suited for self-study and as a supplement to a nonlinear programming class or a class on convex optimization models (rather than theory), based, for example, on the popular book by Boyd and Vanderbergue (Springer, 2004). I highly recommend this book for everyone interested in optimization.

Panos M. Pardalos
Center for Applied Optimization, ISE Department
303 Weil Hall, University of Florida
PO Box 116595
Gainesville, FL 32611-6595
USA
Email: pardalos@ufl.edu

ISSN 1055-6788 print/ISSN 1029-4937 online
DOI: 10.1080/10556781003625177
http://www.informaworld.com