Tuy, Hoang

Convex analysis and global optimization. 2nd edition. (English) Zbl 1362.90001

Springer Optimization and Its Applications 110. Cham: Springer (ISBN 978-3-319-31482-2/hbk; 978-3-319-31484-6/ebook). xvi, 505 p. (2016).

The book is a well-prepared exposition of the state-of-the-art of the theory and algorithms in the area of modern global optimization. It is divided into two parts. The first part introduces the reader to the Convex Analysis. In Chapter 1, the convex sets are discussed, then in Chapter 2 – the convex functions. Next two chapters introduce to the theory of fixed point and equilibrium, as well as to the DC functions. The second part is dedicated to solution methods, in particular the author presents general methods, methods for DC optimization problems, parametric decomposition methods, algorithms for nonconvex quadratic problems, monotonic optimization, polynomial optimization and optimization under equilibrium constraints. The book is well-written and the text is easy to follow. In the end of each chapter there are exercises that allow to better understand the topic. Another good idea was to introduce some examples of real-life applications of global optimization. All those make the book a good choice if one needs a textbook for graduate or PhD course. It would be also suitable for engineers and other practitionners that would like to better understand the algorithms that they use.

Reviewer: Marcin Anholcer (Poznan)

MSC:

90-01	Introductory exposition (textbooks, tutorial papers, etc.) pertaining to operations research and mathematical programming
49-01	Introductory exposition (textbooks, tutorial papers, etc.) pertaining to calculus of variations and optimal control
90C26	Nonconvex programming, global optimization
90C25	Convex programming
90C33	Complementarity and equilibrium problems and variational inequalities (finite dimensions) (aspects of mathematical programming)
90C46	Optimality conditions and duality in mathematical programming
49N15	Duality theory (optimization)

Keywords:

convex analysis; global optimization; mathematical programming; nonconvex programming; DC functions

Full Text: DOI