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Aims and Scope

Optimization has been expanding in all directions at an astonishing rate during the last few decades. New algorithmic and theoretical techniques have been developed, the diffusion into other disciplines has proceeded at a rapid pace, and our knowledge of all aspects of the field has grown even more profound. At the same time, one of the most striking trends in optimization is the constantly increasing emphasis on the interdisciplinary nature of the field. Optimization has been a basic tool in all areas of applied mathematics, engineering, medicine, economics, and other sciences.

The series *Springer Optimization and Its Applications* publishes undergraduate and graduate textbooks, monographs and state-of-the-art expository work that focus on algorithms for solving optimization problems and also study applications involving such problems. Some of the topics covered include nonlinear optimization (convex and nonconvex), network flow problems, stochastic optimization, optimal control, discrete optimization, multi-objective programming, description of software packages, approximation techniques and heuristic approaches.

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Nicholas J. Daras • Themistocles M. Rassias
Editors

Operations Research, Engineering, and Cyber Security

Trends in Applied Mathematics
and Technology

 Springer

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Preface

Operations Research, Engineering, and Cyber Security: Trends in Applied Mathematics and Technology brings together a variety of mathematical methods and theories with several applications from a number of disciplines. It discusses new scientific perspectives of an interdisciplinary nature that pertain to several domains of research from pure and applied mathematical sciences including operations research, engineering, and cyber security.

The book presents 18 papers written by eminent scientists from the international mathematical community. Some representative papers in this book had been communicated during the International Conference held at the Hellenic Artillery School in May 2015.

These contributions focus on new developments of mathematical sciences with emphasis to the solvability of the direct electromagnetic scattering problem, geometric approaches to cyber security, ellipsoid targeting with overlap, nonequilibrium solutions of dynamic networks, measuring ballistic dispersion, elliptic regularity theory for the numerical solution of variational problems, approximation theory for polynomials on the real line and the unit circle, complementarity and variational inequalities in electronics, new two-slope parameterized achievement scalarizing functions for nonlinear multiobjective optimization, and strong and weak convexity of closed sets in a Hilbert space. Furthermore, two papers provide expositions on optimization problems related to security in network systems as well as an investigation of some recent inequalities for relative operator entropy. Some papers in this volume could be particularly useful for a broader readership, specifically in the optimal batch production with time-varying demand over finite planning horizon, electromagnetic compatibility in challenging environment, cybersecurity investments with budget constraints, region-based watermarking for images, optimal inventory policies for finite horizon inventory models with time-varying demand, metrical Pareto efficiency, and monotone Ekeland's variational principle.

We would like to express our deepest thanks to all the contributors of papers in this book. We would also wish to acknowledge the superb assistance that the staff of Springer has provided for this publication.

Vari Attikis, Greece
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Nicholas J. Daras
Themistocles M. Rassias

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