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   Soggetti   Operations research
                             Management science
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   Lingua di pubblicazione   Inglese

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   Nota di bibliografia   Includes bibliographical references and index.

   Nota di contenuto   1. Introduction -- 2. Uncertainty Analysis and Sampling Techniques -- 3. Probability Density Functions and Kernel Density Estimation -- 4. The BONUS Algorithm -- 5. Water Management under Weather Uncertainty -- 6. Real Time Optimization for Water Management -- 7. Sensor Placement under Uncertainty for Power Plants -- 8. The L-Shaped BONUS Algorithm -- 9. The Environmental Trading Problem -- 10. Water Security Networks -- References -- Index.

   Sommario/riassunto   This book presents the details of the BONUS algorithm and its real world applications in areas like sensor placement in large scale drinking water networks, sensor placement in advanced power systems, water management in power systems, and capacity expansion of energy systems. A generalized method for stochastic nonlinear programming based on a sampling based approach for uncertainty analysis and statistical reweighting to obtain probability information is

demonstrated in this book. Stochastic optimization problems are difficult to solve since they involve dealing with optimization and uncertainty loops. There are two fundamental approaches used to solve such problems. The first being the decomposition techniques and the second method identifies problem specific structures and transforms the problem into a deterministic nonlinear programming problem. These techniques have significant limitations on either the objective function type or the underlying distributions for the uncertain variables. Moreover, these methods assume that there are a small number of scenarios to be evaluated for calculation of the probabilistic objective function and constraints. This book begins to tackle these issues by describing a generalized method for stochastic nonlinear programming problems. This title is best suited for practitioners, researchers and students in engineering, operations research, and management science who desire a complete understanding of the BONUS algorithm and its applications to the real world.