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Altri autori (Persone)	OsakiMakoto <1960->
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Nota di contenuto	Preface; Contents; 1. Introduction; 1.1 Probabilistic Analysis: Bad News; 1.2 Probabilistic Analysis: Good News; 1.3 Convergence of Probability and Anti-Optimization; 2. Optimization or Making the Best in the Presence of Certainty/Uncertainty; 2.1 Introduction; 2.2 What Can We Get from Structural Optimization?; 2.3 Definition of the Structural Optimization Problem; 2.4 Various Formulations of Optimization Problems; 2.4.1 Overview of optimization problems; 2.4.2 Classification of optimization problems; 2.4.3 Parametric programming; 2.4.4 Multiobjective programming 2.5 Approximation by Metamodels 2.6 Heuristics; 2.6.1 Overview of heuristics; 2.6.2 Basic approaches of single-point search heuristics; 2.6.2.1 Neighborhood solutions; 2.6.2.2 Basic algorithm of single-point search heuristics; 2.6.2.3 Greedy method; 2.6.3 Simulated annealing; 2.7 Classification of Structural Optimization Problems; 2.8 Probabilistic Optimization; 2.9 Fuzzy Optimization; 3. General Formulation of Anti-Optimization; 3.1 Introduction; 3.2 Models of Uncertainty; 3.3 Interval Analysis; 3.3.1 Introduction; 3.3.2 A simple

example; 3.3.3 General procedure; 3.4 Ellipsoidal Model
 3.4.1 Definition of the ellipsoidal model; 3.4.2 Properties of the ellipsoidal model; 3.5 Anti-Optimization Problem; 3.6 Linearization by Sensitivity Analysis; 3.6.1 Roles of sensitivity analysis in anti-optimization; 3.6.2 Sensitivity analysis of static responses; 3.6.3 Sensitivity analysis of free vibration; 3.6.4 Shape sensitivity analysis of trusses; 3.7 Exact Reanalysis of Static Response; 3.7.1 Overview of exact reanalysis; 3.7.2 Mathematical formulation based on the inverse of the modified matrix; 3.7.3 Mechanical formulation based on virtual load; 4. Anti-Optimization in Static Problems
 4.1 A Simple Example; 4.2 Boley's Pioneering Problem; 4.3 Anti-Optimization Problem for Static Responses; 4.4 Matrix Perturbation Methods for Static Problems; 4.5 Stress Concentration at a Nearly Circular Hole with Uncertain Irregularities; 4.5.1 Introduction; 4.5.2 An asymptotic solution; 4.5.3 A worst-case investigation; 4.6 Anti-Optimization of Prestresses of Tensegrity Structures; 4.6.1 Introduction; 4.6.2 Basic equations; 4.6.2.1 Equilibrium equations; 4.6.2.2 Self-equilibrium forces; 4.6.2.3 Tangent stiffness matrix; 4.6.2.4 Lowest eigenvalue of tangent stiffness matrix; 4.6.2.5 Compliance against external load; 4.6.3 Anti-optimization problem; 4.6.4 Numerical examples; 5. Anti-Optimization in Buckling; 5.1 Introduction; 5.2 A Simple Example; 5.3 Buckling Analysis; 5.4 Anti-Optimization Problem; 5.5 Worst Imperfection of Braced Frame with Multiple Buckling Loads; 5.5.1 Definition of frame model; 5.5.2 Worst imperfection of optimized frame; 5.5.3 Mode interaction; 5.5.4 Worst-case design and worst imperfection under stress constraints; 5.6 Anti-Optimization Based on Convexity of Stability Region; 5.7 Worst Imperfection of an Arch-type Truss with Multiple Member Buckling at Limit Point

Sommario/riassunto

The volume presents a collaboration between internationally recognized experts on anti-optimization and structural optimization, and summarizes various novel ideas, methodologies and results studied over 20 years. The book vividly demonstrates how the concept of uncertainty should be incorporated in a rigorous manner during the process of designing real-world structures. The necessity of anti-optimization approach is first demonstrated, then the anti-optimization techniques are applied to static, dynamic and buckling problems, thus covering the broadest possible set of applications. Finally, a

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