



## Metaheuristic Applications in Structures and Infrastructures

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Due to an ever-decreasing supply in raw materials and stringent constraints on conventional energy sources, demand for lightweight, efficient and low-cost structures has become crucially important in modern engineering design. This requires engineers to search for optimal and robust design options to address design problems that are commonly large in scale and highly nonlinear, making finding solutions challenging. In the past two decades, metaheuristic algorithms have shown promising power, efficiency and versatility in solving these difficult optimization problems.

This book examines the latest developments of metaheuristics and their applications in structural engineering, construction engineering and earthquake engineering, offering practical case studies as examples to demonstrate real-world applications. Topics cover a range of areas within engineering, including big bang-big crunch approach, genetic algorithms, genetic programming, harmony search, swarm intelligence and some other metaheuristic methods. Case studies include structural identification, vibration analysis and control, topology optimization, transport infrastructure design, design of reinforced concrete, performance-based design of structures and smart pavement management. With its wide range of everyday problems and solutions, Metaheuristic Applications in Structures and Infrastructures can serve as a supplementary text for design courses and computation in engineering as well as a reference for researchers and engineers in metaheuristics, optimization in civil engineering and computational intelligence.

- Review of the latest development of metaheuristics in engineering.
- Detailed algorithm descriptions with focus on practical implementation.
- Uses practical case studies as examples and applications.

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