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	Descrizione fisica	1 online resource (XVII, 283 p. 157 illus., 44 illus. in color.)
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	Lingua di pubblicazione	Inglese
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	Nota di bibliografia	Includes bibliographical references.
	Nota di contenuto	Engineering Design and Optimal Design of Complex Mechanical Systems: Definitions -- On the Analytical Derivation of the Pareto-Optimal Set with Application to Structural Design -- Bending Beams of Arbitrary Cross Sections – Optimal Design by Analytical Formulae -- Bending of Lightweight Circular Tubes -- Optimal Design of a Beam Subject to Bending: a Basic Application -- Multi-objective Analytical Optimisation of Highly Inflated Tubes Under Bending -- Thin-Walled Tubes Under Torsion: Multi-Objective Optimal Design -- An Application of Multi-Objective Stochastic Optimisation to Structural Design -- An Application of Analytical Multi-Objective Optimisation to Truss Structures -- Topology Optimisation of Continuum Structures: A Basic Introduction -- Concerned Topological Optimisation of Two Bodies Sharing Design Space -- Structural Optimisation in Road Vehicles Design.
	Sommario/riassunto	This book presents simple design paradigms related to lightweight design, that are derived from an in-depth and theoretically sound analysis based on Pareto theory. It uses numerous examples, including torsion and inflated tubes, to fully explain the theories discussed. Lightweight Construction Principles begins by defining terms in relation to engineering design and optimal design of complex mechanical

systems. It then discusses the analytical derivation of the Pareto-optimal set, before applying analytical formulae to optimal design of bent beams. The book moves through numerous case studies of different beam and tube construction including beams subject to bending, thin walled tubes under torsion and truss structures. This book will be of interest to researchers and graduate students in the field of structural optimisation and multi-objective optimization, as well as to practitioners such as design engineers.