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Collana	Springer Optimization and Its Applications, , 1931-6828 ; ; 114
Disciplina	519.6
Soggetti	Mathematical optimization Computer mathematics Mathematical physics Applied mathematics Engineering mathematics Optimization Computational Mathematics and Numerical Analysis Mathematical Applications in the Physical Sciences Applications of Mathematics
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Preface -- Model Space Vehicle Design Taking into Account Multidisciplinary Couplings and Mixed Epistemic / Aleatory Uncertainties -- Using Direct Transcription to Compute Optimal Low Thrust Transfers Between Libration Point Orbits -- Practical Tentative Solutions for Indirect Optimization of Spacecraft Trajectories -- Resource-constrained Scheduling with Non-constant Capacity and Non-regular Activities -- Packing Problems in Space Solved by CPLEX: an Experimental Analysis -- Designing Complex Interplanetary Trajectories for the Global Trajectory Optimization Competitions -- Satellite Constellation Image Acquisition Problem: A Case Study -- Re-entry Test Vehicle Configuration Selection and Analysis -- Rigorous Global Optimization for Collision Risk Assessment on Perturbed Orbits -- Optimal Robust Design of Hybrid Rocket Engines -- Nonlinear

Regression Analysis by Global Optimization: A Case Study in Space Engineering -- Regression-based Sensitivity Analysis and Robust Design -- Low-Thrust Multi-Revolution Orbit Transfers -- Balance Layout Problems: Mathematical Modeling and Nonlinear Optimization -- Pilot-induced-oscillations Alleviation through Anti-Windup Based Approach -- Modeling and Optimization of Hybrid Transfers to NEOs -- Probabilistic Safety Analysis of the Collision Between Space Debris and a Satellite with an Island Particle Algorithm -- Flatness-based Low-thrust Trajectory Optimization for Spacecraft Proximity Operations.

Sommario/riassunto

This book presents a selection of advanced case studies that cover a substantial range of issues and real-world challenges and applications in space engineering. Vital mathematical modeling, optimization methodologies and numerical solution aspects of each application case study are presented in detail, with discussions of a range of advanced model development and solution techniques and tools. Space engineering challenges are discussed in the following contexts: •Advanced Space Vehicle Design •Computation of Optimal Low Thrust Transfers •Indirect Optimization of Spacecraft Trajectories •Resource-Constrained Scheduling, •Packing Problems in Space •Design of Complex Interplanetary Trajectories •Satellite Constellation Image Acquisition •Re-entry Test Vehicle Configuration Selection •Collision Risk Assessment on Perturbed Orbits •Optimal Robust Design of Hybrid Rocket Engines •Nonlinear Regression Analysis in Space Engineering< •Regression-Based Sensitivity Analysis and Robust Design •Low-Thrust Multi-Revolution Orbit Transfers •Modeling and Optimization of Balance Layout Problems •Pilot-Induced Oscillations Alleviation •Modeling and Optimization of Hybrid Transfers to Near-Earth Objects •Probabilistic Safety Analysis of the Collision Between Space Debris and Satellite •Flatness-based Low-thrust Trajectory Optimization for Spacecraft Proximity Operations The contributing authors are expert researchers and practitioners in either the space engineering and/or in the applied optimization fields. Researchers and practitioners working in various applied aspects of space engineering will find this book practical and informative. Academics, graduate and post-graduate students in aerospace engineering, applied mathematics, operations research, optimization, and optimal control, will find this book useful. .