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Nota di contenuto	Preface and Acknowledgements -- Control Propellant Minimization for the Next Generation Gravity Mission -- Global Optimization of Continuous-Thrust Trajectories Using Evolutionary Neurocontrol -- Nonparametric Importance Sampling Techniques for Sensitivity Analysis and Reliability Assessment of a Launcher Stage Fallout -- Dynamic

System Control Dispatch: A Global Optimization Approach -- Choice of the Optimal Launch Date for Interplanetary Missions -- Optimal Topological Design of a Thermal Isolator for a Monopropellant Space Thruster -- Evidence-Based Robust Optimization of Pulsed Laser Orbital Debris Removal under Epistemic Uncertainty -- Machine Learning and Evolutionary Techniques in Interplanetary Trajectory Design -- Real-Time Optimal Control using TransWORHP and WORHP Zen -- Theory and Applications of Optimal Finite Thrust Orbital Transfers -- Collection Planning and Scheduling for Multiple Heterogeneous Satellite Missions: Optimization Problem and Mathematical Programming Formulation -- Single-Stage-to-Orbit Space-Plane Trajectory Performance Analysis -- Ascent Trajectory Optimization and Neighboring Optimal Guidance of Multistage Launch Vehicles -- Optimization Issues in the Problem of Small Satellite Attitude Determination and Control -- Optimized Packings in Space Engineering Applications – Part I -- Optimized Packings in Space Engineering Applications – Part II -- A Catalogue of Parametric Time-Optimal Transfers for All-Electric GEO Satellites. .

Sommario/riassunto

This book presents advanced case studies that address a range of important issues arising in space engineering. An overview of challenging operational scenarios is presented, with an in-depth exposition of related mathematical modeling, algorithmic and numerical solution aspects. The model development and optimization approaches discussed in the book can be extended also towards other application areas. The topics discussed illustrate current research trends and challenges in space engineering as summarized by the following list: • Next Generation Gravity Missions • Continuous-Thrust Trajectories by Evolutionary Neurocontrol • Nonparametric Importance Sampling for Launcher Stage Fallout • Dynamic System Control Dispatch • Optimal Launch Date of Interplanetary Missions • Optimal Topological Design • Evidence-Based Robust Optimization • Interplanetary Trajectory Design by Machine Learning • Real-Time Optimal Control • Optimal Finite Thrust Orbital Transfers • Planning and Scheduling of Multiple Satellite Missions • Trajectory Performance Analysis • Ascent Trajectory and Guidance Optimization • Small Satellite Attitude Determination and Control • Optimized Packings in Space Engineering • Time-Optimal Transfers of All-Electric GEO Satellites Researchers working on space engineering applications will find this work a valuable, practical source of information. Academics, graduate and post-graduate students working in aerospace, engineering, applied mathematics, operations research, and optimal control will find useful information regarding model development and solution techniques, in conjunction with real-world applications. .