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Boosting of Tethered Satellite Systems by Electrodynamic Forces; Problem Set 2; References; 3 Kane's Method of Linearization Applied to the Dynamics of a Beam in Large Overall Motion; 3.1 Nonlinear Beam Kinematics with Neutral Axis Stretch, Shear, and Torsion; 3.2 Nonlinear Partial Velocities and Partial Angular Velocities for Correct Linearization
3.3 Use of Kane's Method for Direct Derivation of Linearized Dynamical Equations 3.4 Simulation Results for a Space-Based Robotic Manipulator; 3.5 Erroneous Results Obtained Using Vibration Modes in Conventional Analysis; Problem Set 3; References; 4 Dynamics of a Plate in Large Overall Motion; 4.1 Motivating Results of a Simulation; 4.2 Application of Kane's Methodology for Proper Linearization; 4.3 Simulation Algorithm; 4.4 Conclusion; Appendix 4.A Specialized Modal Integrals; Problem Set 4; References; 5 Dynamics of an Arbitrary Flexible Body in Large Overall Motion
5.1 Dynamical Equations with the Use of Vibration Modes 5.2 Compensating for Premature Linearization by Geometric Stiffness due to Inertia Loads; 5.3 Summary of the Algorithm; 5.4 Crucial Test and Validation of the Theory in Application; Appendix 5.A Modal Integrals for an Arbitrary Flexible Body [2]; Problem Set 5; References; 6 Flexible Multibody Dynamics: Dense Matrix Formulation; 6.1 Flexible Body System in a Tree Topology; 6.2 Kinematics of a Joint in a Flexible Multibody Body System; 6.3 Kinematics and Generalized Inertia Forces for a Flexible Multibody System
6.4 Kinematical Recurrence Relations Pertaining to a Body and Its Inboard Body

Sommario/riassunto

"This book describes how to build mathematical models of multibody systems with elastic components. Examples of such systems are the human body itself, construction cranes, cars with trailers, helicopters, spacecraft deploying antennas, tethered satellites, and underwater maneuvering vehicles looking for mines while being connected by a cable to a ship"--