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Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Part I Introduction to balancing -- 1 Introduction -- 2 An overview of balancing methods -- 2.1 Shaking force and shaking moment balancing of linkages -- 2.2 Shaking force and shaking moment balancing of robots and manipulators -- 2.3 Gravity balancing in robotics -- Part II Balancing of Linkages -- 3 Partial shaking force and shaking moment balancing of linkages -- 3.1 Shaking moment minimization of fully force-balanced planar linkages by displacing one counterweight -- 3.2 Shaking moment minimization of fully force-balanced planar linkages by displacing several counterweights -- 3.3 Shaking moment minimization of fully force-balanced spatial linkages -- 3.4 An approximate method of calculating a counterweight for the optimum shaking force and shaking moment balancing of linkages -- 4

Complete shaking force and shaking moment balancing of linkages -- 4.1 Complete shaking force and shaking moment balancing of in-line four-bar linkages by adding a class-two RRR or RRP Assur group -- 4.2 Complete shaking force and shaking moment balancing of planar linkages by adding the articulated dyads -- 4.3 Complete shaking force and shaking moment balancing of RSS'R spatial linkages -- 4.4 Design of self-balanced mechanical systems -- 5 Balancing of slider-crank mechanisms -- 5.1 Generalized Lanchester balancer -- 5.2 Balancing via the properties of the Watt gear-slider mechanism -- 5.3 Shaking moment cancellation of self-balanced slider-crank mechanical systems by means of optimum mass redistribution -- 5.4 Simultaneous inertia force/moment balancing and torque compensation of slider-crank mechanisms -- 5.5 Shaking force and shaking moment balancing of slider-crank mechanisms via optimal generation of the input crank rotation -- Part III Balancing of Robot Manipulators -- 6 Balancing of manipulators by using the copying properties of pantograph mechanisms -- 6.1 Design of balancing mechanisms for spatial parallel manipulators: application to the Delta robot -- 6.2 Design of self-balanced parallel manipulators: PAMINSA with four dof -- 6.3 Design and balancing of hand-operated manipulators -- 7 Shaking force and shaking moment balancing of robot manipulators -- 7.1 Complete shaking force and shaking moment balancing of 3-dof 3-RRR parallel manipulators -- 7.2 Complete shaking force and shaking moment balancing of planar parallel manipulators with prismatic pairs -- 7.3 Shaking force minimization of high-speed robots via centre of mass acceleration control -- 7.4 Balancing of robot manipulators via optimal motion control -- 8 Gravitational force balancing of robotic systems -- 8.1 Balancing of pantograph mechanisms -- 8.2 Optimal balancing of the parallel robot for medical 3D-ultrasound imaging -- 8.3 Improvement of balancing accuracy of robot-manipulators taking into account the spring mass -- 8.4 Optimal balancing of serial manipulators with decoupled dynamics -- References.

Sommario/riassunto

In this book advanced balancing methods for planar and spatial linkages, hand operated and automatic robot manipulators are presented. It is organized into three main parts and eight chapters. The main parts are the introduction to balancing, the balancing of linkages and the balancing of robot manipulators. The review of state-of-the-art literature including more than 500 references discloses particularities of shaking force/moment balancing and gravity compensation methods. Then new methods for balancing of linkages are considered. Methods provided in the second part of the book deal with the partial and complete shaking force/moment balancing of various linkages. A new field for balancing methods applications is the design of mechanical systems for fast manipulation. Special attention is given to the shaking force/moment balancing of robot manipulators. Gravity balancing methods are also discussed. The suggested balancing methods are illustrated by numerous examples.
