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	Nota di contenuto	Intro -- Preface to the Second Edition -- Preface to the First Edition -- Contents -- About the Author -- 1 Introduction to Automation and Robotics -- 1.1 Automatic Systems and Robots -- 1.2 Evolution and Applications of Robots -- 1.3 Examples and Technical Characteristics of Robots -- 1.4 Evaluation of a Robotization -- 1.4.1 An Economic Estimation -- 1.5 Forum for Discussions on Robotics -- 2 Analysis of Manipulations -- 2.1 Decomposition of Manipulative Actions -- 2.2 A Procedure for Analyzing Manipulation Tasks -- 2.3 Programming for Robots -- 2.3.1 A Programming Language for Robots: VAL-II -- 2.3.2 A Programming Language for Robots: ACL -- 2.4 Illustrative Examples -- 2.4.1 Education Practices -- 2.4.2 Industrial Applications -- 3 Fundamentals of the Mechanics of Serial Manipulators -- 3.1 Kinematic Model -- 3.1.1 Transformation Matrix -- 3.1.2 Joint Variables and Actuator Pace -- 3.1.3 Workspace Analysis -- 3.1.4 Manipulator Design with Prescribed Workspace -- 3.1.5 Feasible Area for Workspace -- 3.2 Inverse Kinematics and Path Planning -- 3.2.1 A Formulation for Inverse Kinematics -- 3.2.2 Trajectory Generation in Joint Space -- 3.2.3 A Formulation for Path Planning in Cartesian Coordinates -- 3.3 Velocity and Acceleration Analysis -- 3.3.1 An Example -- 3.4 Jacobian and Singular Configurations -- 3.4.1 An Example -- 3.5 Statics of Manipulators -- 3.5.1 A Mechanical Model -- 3.5.2 Equations of Equilibrium -- 3.5.3 Jacobian Mapping of Forces

| Sommario/riassunto | The book explores the fundamental issues of robot mechanics for both the analysis and design of manipulations, manipulators and grippers, taking into account a central role of mechanics and mechanical structures in the development and use of robotic systems with mechatronic design. It examines manipulations that can be performed by robotic manipulators. The contents of the book are kept at a fairly practical level with the aim to teach how to model, simulate, and operate robotic mechanical systems. The chapters have been written and organized in a way that they can be red even separately, so that they can be used separately for different courses and purposes. The introduction illustrates motivations and historical developments of robotic mechanical systems. Chapter 2 describes the analysis and design of manipulations by automatic machinery and robots; chapter 3 deals with the mechanics of serial-chain manipulators with the aim to propose algorithms for analysis, simulation, and design purposes; chapter 4 introduces the mechanics of parallel manipulators; chapter 5 addresses the attention to mechanical grippers and related mechanics of grasping. |