

1. Record Nr.	UNINA9910785098603321
Autore	Xiong Caihua
Titolo	Fundamentals of robotic grasping and fixturing [[electronic resource] /] / Caihua Xiong, Han Ding, Youlun Xiong
Pubbl/distr/stampa	Singapore ; ; Hackensack, NJ, : World Scientific, c2007
ISBN	1-281-91182-8 9786611911829 981-277-184-0
Descrizione fisica	1 online resource (228 p.)
Collana	Series on manufacturing systems and technology ; ; v. 3
Altri autori (Persone)	DingHan <1963-> XiongYou-Lun
Disciplina	629.892
Soggetti	Robots - Motion - Mathematical models Robot hands - Design and construction
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Contents; Preface; Chapter 1 Robotic Grasp and Workpiece-Fixture Systems; 1.1 Introduction; 1.2 Robotic Manipulation and Multifingered Robotic Hands ; 1.3 AMT and Fixtures; 1.4 Comparison between Grasping and Fixturing; 1.5 Bibliography; Chapter 2 Qualitative Analysis and Quantitative Evaluation of Form-Closure Grasping/Fixturing; 2.1 Introduction; 2.2 Qualitative Analysis; 2.2.1 Kinematic Characteristics of Grasping/Fixturing; 2.2.2 Discriminances of Form-Closure Grasping/Fixturing; 2.2.3 Minimum Number of Contacts with Frictionless; 2.3 Quantitative Evaluation; 2.3.1 Evaluation Criteria 2.3.2 Numerical Example2.4 Summary; 2.5 Bibliography; Chapter 3 Stability Index and Contact Configuration Planning of Force-Closure Grasping/Fixturing; 3.1 Introduction; 3.2 Description of Contacts with Friction; 3.3 Conditions of Force Closure Grasp; 3.4 Grasp Stability Index; 3.4.1 Definition of the Grasp Stability Index; 3.4.2 Some Properties of the Index; 3.4.3 Contact Configuration Planning; 3.5 Examples; 3.6 Summary; 3.7 Bibliography; Chapter 4 Active Grasp Force Planning; 4.1 Introduction; 4.2 Nonlinear Programming in Grasp; 4.3 Force Planning Using Neural Networks; 4.4 Simulation 4.5 Summary4.6 Bibliography; Chapter 5 Grasp Capability Analysis; 5.1

Introduction; 5.2 Evaluation of Multifingered Grasp Capability; 5.3 Numerical Example; 5.4 Summary; 5.5 Bibliography; Chapter 6 Compliant Grasping with Passive Forces; 6.1 Introduction; 6.2 The Model of Compliant Grasping/Fixturing; 6.3 Local Elastic Contact Model; 6.4 Deformation Compatible Constraints for All Contacts; 6.5 Stability of Grasping/Fixturing Systems; 6.6 Passive Force Closure Prediction; 6.7 Numerical Example; 6.8 Summary; 6.9 Bibliography; Chapter 7 Kinematics of Contacts and Rolling Manipulation 7.1 Introduction 7.2 Kinematics of Pure Rolling Contact; 7.3 Kinematics of Manipulation with Rolling Contact; 7.4 Coordinating Manipulation of Multifingered Robotic Hands; 7.4.1 Classification of Grasp Phases; 7.4.2 Coordinating Manipulation Strategy; 7.5 Adjustment of Fingertip Contact Forces; 7.6 Experimental Results; 7.7 Summary; 7.8 Bibliography; Chapter 8 Dynamic Stability of Grasping/Fixturing; 8.1 Introduction; 8.2 Dynamic Equations of Motion for a Grasped/Fixtured Object; 8.3 Dynamic Stability Conditions and Quality Measure; 8.4 Summary; 8.5 Bibliography Chapter 9 Locating Error Analysis and Configuration Planning of Fixtures 9.1 Introduction; 9.2 Error Mapping Model; 9.2.1 Fully Constrained Localization; 9.2.2 Over Constrained Localization; 9.2.3 Under Constrained Localization; 9.3 Locator and Clamp Configuration Characteristics; 9.3.1 Locator Configuration Characteristics; 9.3.2 Clamp Configuration Characteristics; 9.4 Evaluation Indexes of Fixturing; 9.4.1 Evaluation Index of Locator Configurations; 9.4.2 Stability Index of Fixturing; 9.4.3 Fixturing Resultant Index; 9.5 Configuration Planning of Fixturing; 9.5.1 Constraints 9.5.2 Planning Methods

Sommario/riassunto

This book provides a fundamental knowledge of robotic grasping and fixturing (RGF) manipulation. For RGF manipulation to become a science rather than an art, the content of the book is uniquely designed for a thorough understanding of the RGF from the multifingered robot hand grasp, basic fixture design principle, and evaluating and planning of robotic grasping/fixturing, and focuses on the modeling and applications of the RGF. Compared with existing publications, this volume concentrates more on abstract formulation, i.e. mathematical modeling of robotic grasping and fixturing. Thus, it will
