1. Record Nr. UNINA9910568295603321

Autore	Ding Huafeng
Titolo	Automatic Structural Synthesis and Creative Design of Mechanisms / / by Huafeng Ding, Wenjian Yang, Andrés Kecskeméthy
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2022
ISBN	981-19-1508-3
Edizione	[1st ed. 2022.]
Descrizione fisica	1 online resource (302 pages)
Collana	Springer Tracts in Mechanical Engineering, , 2195-9870
Disciplina	620.0042
Soggetti	Engineering design Machinery Engineering Design Machinery and Machine Elements
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	1 Introduction -- Part 1 Topological Structure Analysis -- 2 Basic Concepts of Graphs of Kinematic Chains -- 3 Unified Graph Model of Planar Kinematic chains -- 4 Loop Algebra of Kinematic Chains -- 5 Unified Isomorphism Detection for Planar Kinematic Chains -- 6 Unified Rigid Sub-chain Detection for Planar Kinematic Chains -- Part 2 Topological Structure Synthesis -- 7 Structural Synthesis of Contracted Graphs of Kinematic Chains -- 8 Structural Synthesis of Simple Joint Kinematic Chains -- 9 Automatic Sketching of Planar Kinematic Chains -- 10 Automatic Synthesis of Inversions of Kinematic Chains -- 11 Structural Synthesis of Fractionated Kinematic Chains -- 12 Automatic Synthesis of Kinematic Chains with Prismatic Pairs -- 13 Automatic Synthesis of Planar Multiple Joint Kinematic Chains -- 14 Automatic Synthesis of Planetary Gear Trains -- Part 3 Conceptual Creative Design of Mechanisms -- 15 Automatic Computation of Connectivity in Kinematic Chains -- 16 Conceptual Creative Design of Mechanisms -- Appendix A Contracted graphs with six independent loops.
Sommario/riassunto	This book provides a comprehensive overview of the current research status and open problems in the field of structural synthesis, based on which a systematic methodology for the structural analysis of planar kinematic chains, structural synthesis of planar kinematic chains, and

creative design of mechanisms is presented. The method presented in this book not only promotes the development of theoretical research in the field of mechanical science, and the development of industrial software for the creative design of mechanisms, but also generates novel high-performance mechanisms suitable for industrial application, which can improve the work efficiency and economic benefits. This book offers theoretical guidance for students and researchers engaged in the field of mechanical engineering, especially the creative design of mechanism.