1. Record Nr. UNINA9910483083803321

Titolo	Advanced human-robot collaboration in manufacturing / / editors, Lihui Wang [et al.]
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2021] ©2021
ISBN	3-030-69178-0
Edizione	[1st edition 2021.]
Descrizione fisica	1 online resource (XVIII, 455 p. 215 illus., 156 illus. in color.)
Disciplina	629.8924019
Soggetti	Human-robot interaction Robots, Industrial
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Part I: Literature Survey -- Current Status in Human-Robot Collaborative Assembly -- Latest Developments of Gesture Recognition for Human-Robot Collaboration -- Challenges and Characteristics of Safety for Human-Robot Collaborative Systems -- Part II: Human Safety in Human-Robot Collaboration -- Real-Time Collision and Detection and Collision Avoidance -- Collision-Free Dynamic Robot Trajectory Planning -- Zone-Based Robot Control for Safe Collaboration with Robots -- Part III: Dynamic Planning and Monitoring -- Resource Availability and Capability Monitoring -- Dynamic Assembly Planning and Task Assignment -- Cockpit: A Portal for Symbiotic Human-Robot Collaborative Assembly -- Human-Robot Collaborative Workcell Calibration and Control -- Part IV: Adaptive Robot Control -- Drag&Bot: A Toolbox for Assembly Process Encapsulation -- A Programming-Free Approach for Robot Control Based on Function Blocks -- Sensorless Haptic Control for Physical Human-Robot Interactions -- Part V: Multimodal Decision Support -- Human Worker Tracking and Identification in Dynamic Human-Robot Collaborative Environments -- Multimodal Communication with Robots and Decision Support to Humans -- A Real-World Case Study on Human-Robot Collaborative Assembly.
Sommario/riassunto	This book presents state-of-the-art research, challenges and solutions in the area of human–robot collaboration (HRC) in manufacturing. It

enables readers to better understand the dynamic behaviour of manufacturing processes, and gives more insight into on-demand adaptive control techniques for industrial robots. With increasing complexity and dynamism in today’s manufacturing practice, more precise, robust and practical approaches are needed to support real-time shop-floor operations. This book presents a collection of recent developments and innovations in this area, relying on a wide range of research efforts. The book is divided into five parts. The first part presents a broad-based review of the key areas of HRC, establishing a common ground of understanding in key aspects. Subsequent chapters focus on selected areas of HRC subject to intense recent interest. The second part discusses human safety within HRC. The third, fourth and fifth parts provide in-depth views of relevant methodologies and algorithms. Discussing dynamic planning and monitoring, adaptive control and multi-modal decision making, the latter parts facilitate a better understanding of HRC in real situations. The balance between scope and depth, and theory and applications, means this book appeals to a wide readership, including academic researchers, graduate students, practicing engineers, and those within a variety of roles in manufacturing sectors.