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- The main sensor types such as tactile, odometry, GPS, ranging and visual perception are presented
- Both basic sensor models, sensor data processing and associated representations are covered
- Finally, a chapter on sensor fusion itroduces the mathematical tools needed for integration of sensor information across space and time
- Chap 19 Force and Tactile Sensors Mark Cutkosky and Robert Howe and William Provancher
- Chap 20 Inertial Sensors, GPS and Odometry Gregory Dudek and Michael Jenkin
- Chap 21 Sonar Sensing Lindsay Kleeman and Roman Kuc
- Chap 22 Range Sensors Robert Fisher and Kurt Konolige
- Chap 23 3D Vision and Recognition Kostas Daniliidis and Jan-Olof Eklundh
- Chap 24 Visual Servoing and Visual Tracking Franois Chaumette and Seth Hutchinson
- Chap 25 Sensor Fusion Hugh Durrant-Whyte and Tom Henderson
- Part D Manipulation and Interfaces Makoto Kaneko
- Part D is separated into two subparts
- The first half is concerned with manipulation where frameworks of modeling, motion planning, and control of grasp and manipulation of an object are addressed, and the second half is concerned with interfaces where physical human-robot interactions are handled
- Chap 26 Motion for Manipulation Tasks Oliver Brock and James Kuffner and Jing Xiao
- Chap 27 Modelling and Manipulation Imin Kao and Kevin Lynch and Joel Burdick
- Chap 28 Grasping Jeff Trinkle and Domenico Prattichizzo
- Chap 29 Cooperative Manipulators Fabrizio Caccavale and Masaru Uchiyama
- Chap 30 Haptics Blake Hannaford and Allison Okamura
- Chap 31 Telerobotics Gnter Niemeyer and Carsten Preusche and Gerd Hirzinger
- Chap 32 Networked Teleoperation Dezhen Song and Kenneth Goldberg and Nak Young Chong
- Chap 33 Exoskeletons for Human Performance Augmentation Hami Kazerooni
- Part E Mobile and Distributed Robotics Raja Chatila
- Part E Mobile and Distributed Robotics, covers a wide span
- The topics address motion planning and control of wheeled robots with kinematic constraints, perception and world modeling, simultaneous localization and mapping, and the integration of those capacities in a control architecture, as a mobile robot is actually the paradigm of a complex integrated system
- In addition, multirobot interaction and systems are developed, including modular and reconfigurable robots as well as networked robotics
- Chap 34 Motion Control of Wheeled Mobile Robots Pascal Morin and Claude Samson
- Chap 35 Motion Planning and Obstacle Avoidance Javier Minguez and Florent Lamiraux and Jean-Paul Laumond
- Chap 36 World Modeling Wolfram Burgard and Martial Hebert
- Chap 37 Simultaneous Localization and Mapping Sebastian Thrun and John Leonard
- Chap 38 Behavior-Based Systems Maja Mataric and Franois Michaud
- Chap 39 Distributed and Cellular Robots Zack Butler and Alfred Rizzi
- Chap 40 Multiple Mobile Robot Systems Lynne Parker
- Chap 41 Networked Robots Vijay Kumar and Daniela Rus and Gaurav Sukhatme

- Part F Field and Service Robotics Alexander Zelinsky
- Part F covers topics related to creating field and service application based robots that operate in all types of environments
- This includes applications ranging from industrial-robots, through a diverse array of air, land, sea and space applications to educational robotics
- This part of the handbook draws on Parts A-E and describes how robots can be put to work
- The chapters describe fit for purpose robots and include hardware design, control, perception, and user interfaces
- The economic and social drivers for the particular applications are also discussed
- Chap 42 Industrial Robotics Martin Hgele and Klas Nilsson and Norberto Pires
- Chap 43 Underwater Robotics Gianluca Antonelli and Thor Inge Fossen and Dana Yoerger
- Chap 44 Aerial Robotics Eric Feron and Eric Johnson
- Chap 45 Space Robots and Systems Kazuya Yoshida and Brian Wilcox
- Chap 46 Robotics in Agriculture and Forestry John Billingsley and Arto Visala and Mark Dunn
- Chap 47 Robotics in Construction Kamel Saidi and Jonathan O'Brien and Alan Lytle
- Chap 48 Robotics in Hazardous Applications James Trevelyan and Sungchul Kang and William Hamel
- Chap 49 Mining Robotics Peter Corke and Jonathan Roberts and Jock Cunningham and David Hainsworth
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- Chap 52 Medical Robots and Systems Russell Taylor and Arianna Menciassi and Gabor Fichtinger and Paolo Dario
- Chap 53 Rehabilitation and Health Care Robotics Machiel van der Loos and David J. Reinkensmeyer
- Chap 54 Domestic Robots Erwin Prassler and Kazuhiro Kosuge
- Chap 55 Robots for Education David Miller and Illah Nourbakhsh and Roland Siegwart
- Part G Human-Centered and Life-Like Robotics Daniela Rus
- Part G covers topics related to creating robots that operate in human-centered environments
- This includes the design of robots with humanoid and other biologically inspired morphologies, sensors, actuators, and control architectures
- User interfaces such as programming by demonstration and programming for safety are also included in this part
- The part concludes with the socio-ethical implications of robots
- Chap 56 Humanoids Charles Kemp and Paul Fitzpatrick and Hirohisa Hirukawa and Kazuhito Yokoi and Kensuke Harada and Yoshio Matsumoto
- Chap 57 Safety for Physical Human-Robot Interaction Antonio Bicchi and Michael Peshkin and Edward Colgate
- Chap 58 Social Robots that Interact with People Cynthia Breazeal and Atsuo Takanishi and Tetsunori Kobayashi