

1. Record Nr.	UNINA9910813585903321
Autore	Kagan Eugene
Titolo	Autonomous mobile robots and multi-robot systems : motion-planning, communication and swarming // edited by Eugene Kagan, Nir Shvalb, Irad Ben-Gal
Pubbl/distr/stampa	Hoboken, New Jersey ; ; Chichester, West Sussex, England : , : Wiley, , [2020] ©2020
ISBN	1-119-21316-9 1-5231-3281-7 1-119-21317-7 1-119-21315-0
Edizione	[1st edition]
Descrizione fisica	1 online resource (343 pages)
Disciplina	629.8932
Soggetti	Mobile robots - Automatic control
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Motion-planning schemes in global coordinates -- Basic perception -- Motion in the global coordinates -- Motion in potential field and navigation function -- GNSS and robot localization -- Motion in local coordinates -- Motion in unknown environment -- Energy limitations and energetic efficiency of mobile robots -- Multi-robot systems and swarming -- Collective motion with shared environment map -- Collective motion with direct and indirect communication -- Brownian motion and swarm dynamics -- Conclusions.
Sommario/riassunto	Offers a theoretical and practical guide to the communication and navigation of autonomous mobile robots and multi-robot systems This book covers the methods and algorithms for the navigation, motion planning, and control of mobile robots acting individually and in groups. It addresses methods of positioning in global and local coordinates systems, off-line and on-line path-planning, sensing and sensors fusion, algorithms of obstacle avoidance, swarming techniques and cooperative behavior. The book includes ready-to-use algorithms, numerical examples and simulations, which can be directly

implemented in both simple and advanced mobile robots, and is accompanied by a website hosting codes, videos, and PowerPoint slides

Autonomous Mobile Robots and Multi-Robot Systems: Motion-Planning, Communication and Swarming consists of four main parts. The first looks at the models and algorithms of navigation and motion planning in global coordinates systems with complete information about the robot's location and velocity. The second part considers the motion of the robots in the potential field, which is defined by the environmental states of the robot's expectations and knowledge. The robot's motion in the unknown environments and the corresponding tasks of environment mapping using sensed information is covered in the third part. The fourth part deals with the multi-robot systems and swarm dynamics in two and three dimensions. Provides a self-contained, theoretical guide to understanding mobile robot control and navigation Features implementable algorithms, numerical examples, and simulations Includes coverage of models of motion in global and local coordinates systems with and without direct communication between the robots Supplemented by a companion website offering codes, videos, and PowerPoint slides

Autonomous Mobile Robots and Multi-Robot Systems: Motion-Planning, Communication and Swarming is an excellent tool for researchers, lecturers, senior undergraduate and graduate students, and engineers dealing with mobile robots and related issues.
