



# Introduction to Autonomous Mobile Robots (Intelligent Robotics and Autonomous Agents series)

*By Roland Siegwart, Illah Reza Nourbakhsh, Davide Scaramuzza*

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**Introduction to Autonomous Mobile Robots (Intelligent Robotics and Autonomous Agents series)** By Roland Siegwart, Illah Reza Nourbakhsh, Davide Scaramuzza

Mobile robots range from the Mars Pathfinder mission's teleoperated Sojourner to the cleaning robots in the Paris Metro. This text offers students and other interested readers an introduction to the fundamentals of mobile robotics, spanning the mechanical, motor, sensory, perceptual, and cognitive layers the field comprises. The text focuses on mobility itself, offering an overview of the mechanisms that allow a mobile robot to move through a real world environment to perform its tasks, including locomotion, sensing, localization, and motion planning. It synthesizes material from such fields as kinematics, control theory, signal analysis, computer vision, information theory, artificial intelligence, and probability theory. The book presents the techniques and technology that enable mobility in a series of interacting modules. Each chapter treats a different aspect of mobility, as the book moves from low-level to high-level details. It covers all aspects of mobile robotics, including software and hardware design considerations, related technologies, and algorithmic techniques.

This second edition has been revised and updated throughout, with 130 pages of new material on such topics as locomotion, perception, localization, and planning and navigation. Problem sets have been added at the end of each chapter. Bringing together all aspects of mobile robotics into one volume, *Introduction to Autonomous Mobile Robots* can serve as a textbook or a working tool for beginning practitioners.

Curriculum developed by Dr. Robert King, Colorado School of Mines, and Dr. James Conrad, University of North Carolina-Charlotte, to accompany the National Instruments LabVIEW Robotics Starter Kit, are available. Included are 13 (6 by Dr. King and 7 by Dr. Conrad) laboratory exercises for using the LabVIEW Robotics Starter Kit to teach mobile robotics concepts.

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### **Editorial Review**

#### **Review**

This book is well suited for graduate courses in robotics, where it can provide a synthesis of the solutions and rapidly introduce problems for research.

**(G. Gini *Computing Reviews*)**

This text provides a clear and systematic development of the essentials of mobile robotics. The second edition adds up-to-date material to a book that has already been adopted in robotics classes worldwide. With this guide in hand, students and readers will swiftly navigate the field toward more advanced systems.

**(Raja Chatila, LAAS-CNRS, France)**

#### **About the Author**

Davide Scaramuzza is Senior Researcher at the Autonomous Systems Lab at ETH Zürich, where he is also a lecturer and leader of the European project sFly.

Roland Siegwart is Professor of Autonomous Systems and Director of the Center for Product Design at the Institute of Robotics and Intelligent Systems, ETH Zürich.

Illah R. Nourbakhsh is Associate Professor of Robotics in the Robotics Institute, School of Computer Science, at Carnegie Mellon University.

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