

Contents

I	<i>Sensors and Sensor Fusion</i>	1
Chapter 1	Visual Guidance for Autonomous Vehicles: Capability and Challenges	5
	<i>Andrew Shacklock, Jian Xu, and Han Wang</i>	
Chapter 2	Millimeter Wave RADAR Power-Range Spectra Interpretation for Multiple Feature Detection	41
	<i>Martin Adams and Ebi Jose</i>	
Chapter 3	Data Fusion via Kalman Filter: GPS and INS	99
	<i>Jingrong Cheng, Yu Lu, Elmer R. Thomas, and Jay A. Farrell</i>	
Chapter 4	Landmarks and Triangulation in Navigation	149
	<i>Huosheng Hu, Julian Ryde, and Jiali Shen</i>	
II	<i>Modeling and Control</i>	187
Chapter 5	Stabilization of Nonholonomic Systems	191
	<i>Alessandro Astolfi</i>	
Chapter 6	Adaptive Neural-Fuzzy Control of Nonholonomic Mobile Robots	229
	<i>Fan Hong, Shuzhi Sam Ge, Frank L. Lewis, and Tong Heng Lee</i>	
Chapter 7	Adaptive Control of Mobile Robots Including Actuator Dynamics	267
	<i>Zhuping Wang, Chun-Yi Su, and Shuzhi Sam Ge</i>	

Chapter 8	Unified Control Design for Autonomous Car-Like Vehicle Tracking Maneuvers	295
	<i>Danwei Wang and Minhtuan Pham</i>	
III Map Building and Path Planning		331
Chapter 9	Map Building and SLAM Algorithms	335
	<i>José A. Castellanos, José Neira, and Juan D. Tardós</i>	
Chapter 10	Motion Planning: Recent Developments.....	373
	<i>Héctor H. González-Baños, David Hsu, and Jean-Claude Latombe</i>	
Chapter 11	Multi-Robot Cooperation.....	417
	<i>Rafael Fierro, Luiz Chaimowicz, and Vijay Kumar</i>	
IV Decision Making and Autonomy		461
Chapter 12	Knowledge Representation and Decision Making for Mobile Robots	465
	<i>Elena Messina and Stephen Balakirsky</i>	
Chapter 13	Algorithms for Planning under Uncertainty in Prediction and Sensing	501
	<i>Jason M. O’Kane, Benjamín Tovar, Peng Cheng, and Steven M. LaValle</i>	
Chapter 14	Behavior-Based Coordination in Multi-Robot Systems.....	549
	<i>Chris Jones and Maja J. Matarić</i>	
V System Integration and Applications.....		571
Chapter 15	Integration for Complex Consumer Robotic Systems: Case Studies and Analysis	573
	<i>Mario E. Munich, James P. Ostrowski, and Paolo Pirjanian</i>	

Contents	xxi
Chapter 16 Automotive Systems/Robotic Vehicles	613
<i>Michel R. Parent and Stéphane R. Petti</i>	
Chapter 17 Intelligent Systems.....	655
<i>Sesh Commuri, James S. Albus, and Anthony Barbera</i>	
Index	697