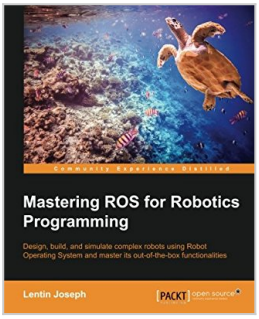

Mastering ROS for Robotics Programming

By Lentin Joseph

Mastering ROS for Robotics Programming By Lentin Joseph

Design, build and simulate complex robots using Robot Operating System and master its out-of-the-box functionalities

About This Book

- Develop complex robotic applications using ROS for interfacing robot manipulators and mobile robots with the help of high end robotic sensors
- Gain insights into autonomous navigation in mobile robot and motion planning in robot manipulators
- Discover the best practices and troubleshooting solutions everyone needs when working on ROS

Who This Book Is For

If you are a robotics enthusiast or researcher who wants to learn more about building robot applications using ROS, this book is for you. In order to learn from this book, you should have a basic knowledge of ROS, GNU/Linux, and C++ programming concepts. The book will also be good for programmers who want to explore the advanced features of ROS.

What You Will Learn

- Create a robot model of a Seven-DOF robotic arm and a differential wheeled mobile robot
- Work with motion planning of a Seven-DOF arm using MoveIt!
- Implement autonomous navigation in differential drive robots using SLAM and AMCL packages in ROS
- Dig deep into the ROS Pluginlib, ROS nodelets, and Gazebo plugins
- Interface I/O boards such as Arduino, Robot sensors, and High end actuators with ROS
- Simulation and motion planning of ABB and Universal arm using ROS Industrial
- Explore the ROS framework using its latest version

In Detail

The area of robotics is gaining huge momentum among corporate people, researchers, hobbyists, and students. The major challenge in robotics is its controlling software. The Robot Operating System (ROS) is a modular software platform to develop generic robotic applications.

This book discusses the advanced concepts in robotics and how to program using ROS. It starts with deep overview of the ROS framework, which will give you a clear idea of how ROS really works. During the course of the book, you will learn how to build models of complex robots, and simulate and interface the robot using the ROS MoveIt motion planning library and ROS navigation stacks.

After discussing robot manipulation and navigation in robots, you will get to grips with the interfacing I/O boards, sensors, and actuators of ROS. One of the essential ingredients of robots are vision sensors, and an entire chapter is dedicated to the vision sensor, its interfacing in ROS, and its programming.

You will discuss the hardware interfacing and simulation of complex robot to ROS and ROS Industrial (Package used for interfacing industrial robots).

Finally, you will get to know the best practices to follow when programming using ROS.

Style and approach

This is a simplified guide to help you learn and master advanced topics in ROS using hands-on examples.

Mastering ROS for Robotics Programming

By Lentin Joseph

Mastering ROS for Robotics Programming By Lentin Joseph

Design, build and simulate complex robots using Robot Operating System and master its out-of-the-box functionalities

About This Book

- Develop complex robotic applications using ROS for interfacing robot manipulators and mobile robots with the help of high end robotic sensors
- Gain insights into autonomous navigation in mobile robot and motion planning in robot manipulators
- Discover the best practices and troubleshooting solutions everyone needs when working on ROS

Who This Book Is For

If you are a robotics enthusiast or researcher who wants to learn more about building robot applications using ROS, this book is for you. In order to learn from this book, you should have a basic knowledge of ROS, GNU/Linux, and C++ programming concepts. The book will also be good for programmers who want to explore the advanced features of ROS.

What You Will Learn

- Create a robot model of a Seven-DOF robotic arm and a differential wheeled mobile robot
- Work with motion planning of a Seven-DOF arm using MoveIt!
- Implement autonomous navigation in differential drive robots using SLAM and AMCL packages in ROS
- Dig deep into the ROS Pluginlib, ROS nodelets, and Gazebo plugins
- Interface I/O boards such as Arduino, Robot sensors, and High end actuators with ROS
- Simulation and motion planning of ABB and Universal arm using ROS Industrial
- Explore the ROS framework using its latest version

In Detail

The area of robotics is gaining huge momentum among corporate people, researchers, hobbyists, and students. The major challenge in robotics is its controlling software. The Robot Operating System (ROS) is a modular software platform to develop generic robotic applications.

This book discusses the advanced concepts in robotics and how to program using ROS. It starts with deep overview of the ROS framework, which will give you a clear idea of how ROS really works. During the course of the book, you will learn how to build models of complex robots, and simulate and interface the robot using the ROS MoveIt motion planning library and ROS navigation stacks.

After discussing robot manipulation and navigation in robots, you will get to grips with the interfacing I/O boards, sensors, and actuators of ROS. One of the essential ingredients of robots are vision sensors, and an entire chapter is dedicated to the vision sensor, its interfacing in ROS, and its programming.

You will discuss the hardware interfacing and simulation of complex robot to ROS and ROS Industrial (Package used for interfacing industrial robots).

Finally, you will get to know the best practices to follow when programming using ROS.

Style and approach

This is a simplified guide to help you learn and master advanced topics in ROS using hands-on examples.

Mastering ROS for Robotics Programming By Lentin Joseph Bibliography

- Sales Rank: #210311 in Books
- Published on: 2015-12-21
- Released on: 2015-12-21
- Original language: English
- Number of items: 1
- Dimensions: 9.25" h x 1.09" w x 7.50" l, 1.80 pounds
- Binding: Paperback
- 480 pages

Editorial Review

About the Author

Lentin Joseph

Lentin Joseph is an author, entrepreneur, electronics engineer, robotics enthusiast, machine vision expert, embedded programmer, and the founder and CEO of Qbotics Labs (http://www.qboticslabs.com) from India. He completed his bachelor's degree in electronics and communication engineering at the Federal Institute of Science and Technology (FISAT), Kerala. For his final year engineering project, he made a social robot that can interact with people. The project was a huge success and was mentioned in many forms of visual and print media. The main features of this robot were that it can communicate with people and reply intelligently and has some image processing capabilities such as face, motion, and color detection. The entire project was implemented using the Python programming language. His interest in robotics, image processing, and Python started with that project. After his graduation, for 3 years he worked in a start-up company focusing on robotics and image processing. In the meantime, he learned famous robotic software platforms such as Robot Operating System (ROS), V-REP, Actin (a robotic simulation tool), and image processing libraries such as OpenCV, OpenNI, and PCL. He also knows robot 3D designing and embedded programming on Arduino and Tiva Launchpad. After 3 years of work experience, he started a new company called Qbotics Labs, which mainly focuses on research to build up some great products in domains such as robotics and machine vision. He maintains a personal website (http://www.lentinjoseph.com) and a technology blog called technolabsz (http://www.technolabsz.com). He publishes his works on his tech blog. He was also a speaker at PyCon2013, India, on the topic Learning Robotics using Python. Lentin is the author of the book Learning Robotics Using Python (refer to http://learn-robotics.com to know more) by Packt Publishing. The book was about building an autonomous mobile robot using ROS and OpenCV. The book was launched in ICRA 2015 and was featured in the ROS blog, Robohub, OpenCV, the Python website, and various other such forums. Lentin was a finalist in the ICRA 2015 challenge, HRATC (http://www2.isr.uc.pt/~embedded/events/HRATC2015/Welcome.html).

Users Review

From reader reviews:

Mary Barnett:

This Mastering ROS for Robotics Programming are reliable for you who want to be described as a successful person, why. The explanation of this Mastering ROS for Robotics Programming can be one of the great books you must have is definitely giving you more than just simple looking at food but feed a person with information that perhaps will shock your previous knowledge. This book is usually handy, you can bring it almost everywhere and whenever your conditions throughout the e-book and printed ones. Beside that this Mastering ROS for Robotics Programming giving you an enormous of experience like rich vocabulary, giving you demo of critical thinking that we all know it useful in your day pastime. So , let's have it and luxuriate in reading.

Garnet Veach:

People live in this new day time of lifestyle always make an effort to and must have the free time or they will get wide range of stress from both lifestyle and work. So , whenever we ask do people have time, we will say absolutely sure. People is human not only a robot. Then we question again, what kind of activity are you experiencing when the spare time coming to a person of course your answer will certainly unlimited right. Then ever try this one, reading publications. It can be your alternative with spending your spare time, often the book you have read is actually Mastering ROS for Robotics Programming.

Ronald Meyers:

Do you have something that you prefer such as book? The e-book lovers usually prefer to pick book like comic, limited story and the biggest some may be novel. Now, why not hoping Mastering ROS for Robotics Programming that give your pleasure preference will be satisfied simply by reading this book. Reading routine all over the world can be said as the method for people to know world better then how they react towards the world. It can't be said constantly that reading practice only for the geeky individual but for all of you who wants to end up being success person. So , for all you who want to start reading through as your good habit, you can pick Mastering ROS for Robotics Programming become your own personal starter.

Kimberly Plummer:

You may spend your free time to learn this book this book. This Mastering ROS for Robotics Programming is simple to develop you can read it in the area, in the beach, train along with soon. If you did not possess much space to bring often the printed book, you can buy often the e-book. It is make you simpler to read it. You can save typically the book in your smart phone. Consequently there are a lot of benefits that you will get when one buys this book.

Read Mastering ROS for Robotics Programming By Lentin Joseph for online ebook

Mastering ROS for Robotics Programming By Lentin Joseph Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Mastering ROS for Robotics Programming By Lentin Joseph books to read online.

Online Mastering ROS for Robotics Programming By Lentin Joseph ebook PDF download

Mastering ROS for Robotics Programming By Lentin Joseph Doc

Mastering ROS for Robotics Programming By Lentin Joseph Mobipocket

Mastering ROS for Robotics Programming By Lentin Joseph EPub

XHUJWNMYLVP: Mastering ROS for Robotics Programming By Lentin Joseph