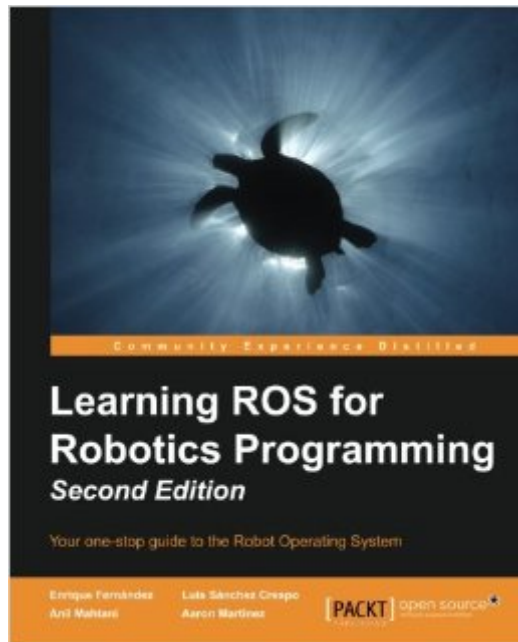


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# Learning ROS For Robotics Programming - Second Edition



## Synopsis

Your one-stop guide to the Robot Operating System About This Book Model your robot on a virtual world and learn how to simulate it Create, visualize, and process Point Cloud information Easy-to-follow, practical tutorials to program your own robots Who This Book Is For In order to make the most of the book, you should have a C++ programming background, knowledge of GNU/Linux systems, and general skills in computer science. No previous background in ROS is required, as this book takes you from the ground up. What You Will Learn Install a complete ROS Hydro system Create ROS packages and metapackages, using and debugging them in real time Build, handle, and debug ROS nodes Design your 3D robot model and simulate it in a virtual environment within Gazebo Generate and adapt the navigation stack to work with your robot Integrate different sensors such as Range Laser, Arduino, and Kinect with your robot Visualize and process Point Cloud information from different sensors Control and plan the motion of robotic arms with multiple joints using MoveIt!

In Detail Starting at an introductory level, this book is a comprehensive guide to the fascinating world of robotics, covering sensor integration, modeling, simulation, computer vision, navigation algorithms, and more. You will then go on to explore concepts such as topics, messages, and nodes. Next, you will learn how to make your robot see with HD cameras, or navigate obstacles with range sensors. What's new in this updated edition? First and foremost, we are going to work with ROS Hydro this time around. You will learn how to create, visualize, and process point cloud information from different sensors. This edition will also show you how to control and plan the motion of robotic arms with multiple joints using MoveIt!

## Book Information

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## Customer Reviews

I'm one of the technical reviewers of this book. As far as I read, I recommend this book to new challengers to intelligent robots and highly motivated people who want to extend the capabilities of their own robot. As I myself am working in the field of space robotics, this book will surely solve some of my colleagues' technical problems. Robot Operating System (ROS) is middleware to operate robots. It provides essential functions to develop complicated system. The famous examples of using ROS are DARPA Robotics Challenge and Robonaut 2. This book starts with how to set up ROS on your computer. In later chapters, you can learn how to connect sensors and actuators, process image (mono/stereo) and point cloud data using OpenCV and PCL, use dynamics simulator (GAZEBO), and navigate or manipulate robots. Each chapter provides explanations, one by one, and has sample programs and links to the repository. This point is very important because ROS and its programs are developed and maintained by open source community. This book can provide reader with comprehensive view and a good foothold to start with this technology. Finally, though ROS version Hydro is mainly discussed in this book, the differences between Hydro and Indigo (the newer and long-term supported one) is quite small. Therefore, this book will be useful for a long time.

This book is the best way I've seen for those wanting to get started with ROS. Unlike official ROS tutorials, instead of talking about somewhat abstract concepts behind ROS it uses concrete examples that most robotics beginners can relate to. This book has the first instance of an end to end tutorial (that I've come across) that shows how to get a custom robot arm set up with the MoveIt! toolkit to allow for inverse kinematics, trajectory planning and object collisions. Given how much easier ROS is to understand with this book I've started recommending it to people at the local robotics meetup!

The book contains pretty much all the information you need to setup run and play with ROS operating system. The second edition is based upon the ROS distro named Hydro, which, in Ubuntu linux, is supported prior to version 14.04. If you want to play with newer distros, you might encounter some differences. The book is really rich in examples and explanations and guides the reader through all of them. From setup, debug, usage of a great amount of sensors, to simulation and beyond, the book and the code help the reader dive into the fascinating world of robotics.

It is a book of whopping 450+ pages packed with information on ROS tools. The book gave a comprehensive overview to me on the ROS tools. The book starts with the steps for working installation of ROS and introduces ROS Architecture and Concepts such as nodes, topics, and services. It further introduces Visualization and Debug Tools, Using Sensors and Actuators, Computer Vision, Point Clouds, 3D Modeling and Simulation, and The Navigation Stack. The book continues the discussion by showing how we can effectively make robot navigate autonomously. Pros: Easy to follow. There is even a chapter on MoveIt! - a set of tools for mobile manipulation in ROS. Cons: none that I came across.

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