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   Sommario/riassunto Find out everything you need to know to build powerful robots with the
                       most up-to-date ROS About This Book This comprehensive, yet easy-
                       to-follow guide will help you find your way through the ROS framework
                       Successfully design and simulate your 3D robot model and use
                       powerful robotics algorithms and tools to program and set up your
                       robots with an unparalleled experience by using the exciting new
                       features from Robot Kinetic Use the latest version of gazebo simulator,
                       OpenCV 3.0, and C++11 standard for your own algorithms Who This
                       Book Is For This book is suitable for an ROS beginner as well as an
                       experienced ROS roboticist or ROS user or developer who is curious to
                       learn ROS Kinetic and its features to make an autonomous Robot. The
                       book is also suitable for those who want to integrate sensors and
                       embedded systems with other software and tools using ROS as a
                       framework. What You Will Learn Understand the concepts of ROS, the
                       command-line tools, visualization GUIs, and how to debug ROS
                       Connect robot sensors and actuators to ROS Obtain and analyze data
                       from cameras and 3D sensors Use Gazebo for robot/sensor and
                       environment simulation Design a robot and see how to make it map the
                       environment, navigate autonomously, and manipulate objects in the

environment using MoveIt! Add vision capabilities to the robot using OpenCV 3.0 Add 3D perception capabilities to the robot using the latest version of PCL In Detail Building and programming a robot can be cumbersome and time-consuming, but not when you have the right collection of tools, libraries, and more importantly expert collaboration. ROS enables collaborative software development and offers an unmatched simulated environment that simplifies the entire robot building process. This book is packed with hands-on examples that will help you program your robot and give you complete solutions using open source ROS libraries and tools. It also shows you how to use virtual machines and Docker containers to simplify the installation of Ubuntu and the ROS framework, so you can start working in an isolated and control environment without changing your regular computer setup. It starts with the installation and basic concepts, then continues with more complex modules available in ROS such as sensors and actuators integration (drivers), navigation and mapping (so you can create an autonomous mobile robot), manipulation, Computer Vision, perception in 3D with PCL, and more. By the end of the book, you'll be able to l...