

ROS Made Easy//0: Introduction and Installation

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1 Important Note

This tutorial was created for **ROS1 Melodic Morenia** on **Ubuntu 18.04 Bionic Beaver**, in **June 2020**. These tutorials expect that you are running a version of Ubuntu. I expect them to become rapidly out of date. It is my hope that Team Enigma will maintain these tutorials, firstly, by porting them to ROS1 Noetic Ninjemys once packages for it become available, and later on, converting them to ROS2.

2 Introduction: The motivation behind ROS

In any field of software engineering, we find that instead of repeatedly reinventing the wheel, it is instead useful to create and use standardised packages and libraries for common tasks and workflows. The same is true for the field of robotics.

ROS, or the **Robot Operating System** provides this functionality. ROS allows you to separate the problem of low-level hardware control from things like motion planning and perception. It provides a standardised and portable mechanism for communication between multiple processes – both within a system and across a network. It provides tools for robot visualization and simulation and for common tasks like inverse kinematics. ROS can be thought of as an operating system because it provides all the functions that are expected of one. For more details, see <http://wiki.ros.org/ROS/Introduction>.

Well-designed ROS systems separate the low-level control of the hardware and high-level processing and decision-making into two (or more) separate programs.

3 Core concepts

Dumby

4 Installation

1. Follow the installation instructions at <http://wiki.ros.org/melodic/Installation/Ubuntu> and do a **full installation**. This is very important, because it provides many add-ons, including the **Gazebo simulator** baked into ROS. Getting them later on and integrating them with ROS later on may be difficult.

2. Ensure that you add the following line to `/.bashrc`:

```
source /opt/ros/setup.bash
```

3. Close all active terminals and open a fresh terminal.

4. Run the following command:

```
export | grep ROS
```

which should display a bunch of environment variables.