

University of South Florida

Control of Mobile Robots

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Installing ROS

Step 1: You may find that your Operating System is not compatible with ROS Kinetic which is required for running the software to communicate with the robot, so you may need to install Ubuntu 16.04 for dual-booting on your machine. (<http://releases.ubuntu.com/16.04/>).

If you are using a Mac, this tutorial explains how to do so: (<https://www.youtube.com/watch?v=kRgKlcm1XPI>)

Step 2: Install ROS Kinetic(<http://wiki.ros.org/kinetic/Installation/Ubuntu>). For **section 1.4** it is necessary to run the **Full Installation**.

Step 3: Install a catkin workspace by opening the terminal and running the following commands. (http://wiki.ros.org/catkin/Tutorials/create_a_workspace)

```
mkdir -p ~/catkin_ws/src
```

```
cd ~/catkin_ws/
```

```
catkin_make
```

```
source devel/setup.bash
```

Step 4: Install the robot_client program from (https://github.com/biorobaw/pi3_robot_2019/tree/python_client) and place it in ~/catkin_ws/src.

You may need to change the permissions to allow the contents of the folder to be readable, writable, and executable.

Running the programs

Step 1. You will need to connect to the robot via VNC(<https://www.realvnc.com/en/>) and run the following commands via the robot's terminal

```
export ROS_IP=<robot's ip address>
```

```
export ROS_SERVER_URI=http://<robot's ip address>:11311
```

```
export ROS_MASTER_URI=http://<robot's ip address>:11311
```

```
roslaunch pi3_robot_2019 pi3_robot_2019.launch
```

Step 2. On your computer run the following commands

```
cd ~/catkin_ws
```

```
source devel/setup.bash
```

```
export ROS_IP=<your ip address>
```

```
export ROS_SERVER_URI=http://<robot's ip address>:11311
```

```
export ROS_MASTER_URI=http://<robot's ip address>:11311
```

Step 3. Use rosun to run any of the programs.

```
rosrun robot_client <program name>
```

MController.py allows you to see the readings from the robots sensors and encoders and set the robots speeds manually. If you are having any problems, this is a useful program to run for troubleshooting. If we were running this program we would run the command

```
rosrun robot_client MController.py
```