ROS Noetic Installation

*You can **skip** this installation if you already have Ubuntu 20.04 LTS and ROS Noetic on your own PC/Laptop

1. Install Ubuntu on PC

1. Download the proper Ubuntu 20.04 LTS Desktop image for your PC from the links below.
   https://releases.ubuntu.com/20.04/
2. Follow the instructions below to install Ubuntu on PC.
   https://ubuntu.com/tutorials/install-ubuntu-desktop#1-overview

2. Installation of ROS Noetic on Ubuntu

Open terminal by press “Ctrl + Alt + T” and run command following below on at a time:

```
sudo apt update
sudo apt upgrade
wget https://raw.githubusercontent.com/ROBOTIS-GIT/robotis_tools/master/install_ros_noetic.sh
chmod 755 ./install_ros_noetic.sh
$ bash ./install_ros_noetic.sh
```

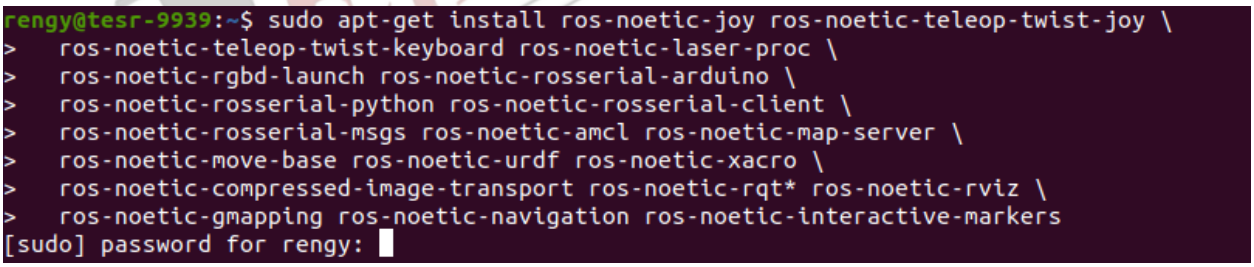
If the above installation fails, please refer to the official ROS1 Noetic installation guide.

http://wiki.ros.org/noetic/Installation/Ubuntu

3. Install Dependent ROS Packages

Run command line following below:

```
sudo apt-get install ros-noetic-joy ros-noetic-teleop-twist-joy \
  ros-noetic-teleop-twist-keyboard ros-noetic-laser-proc \
  ros-noetic-rgbd-launch ros-noetic-rosserial-arduino \
  ros-noetic-rosserial-python ros-noetic-rosserial-client \
  ros-noetic-rosserial-msgs ros-noetic-amcl ros-noetic-map-server \
  ros-noetic-move-base ros-noetic-urdf ros-noetic-xacro \
  ros-noetic-compressed-image-transport ros-noetic-rqt* ros-noetic-rviz \
  ros-noetic-gmapping ros-noetic-navigation ros-noetic-interactive-markers
```

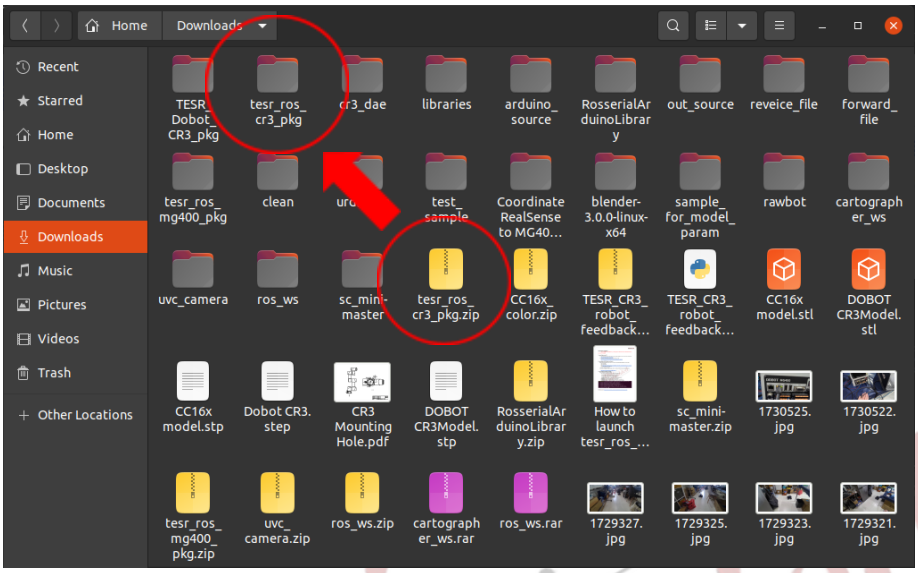


Reference Link: https://emanual.robotis.com/docs/en/platform/turtlebot3/quick-start/

How to launch tesr_ros_cr3_pkg

Step 1

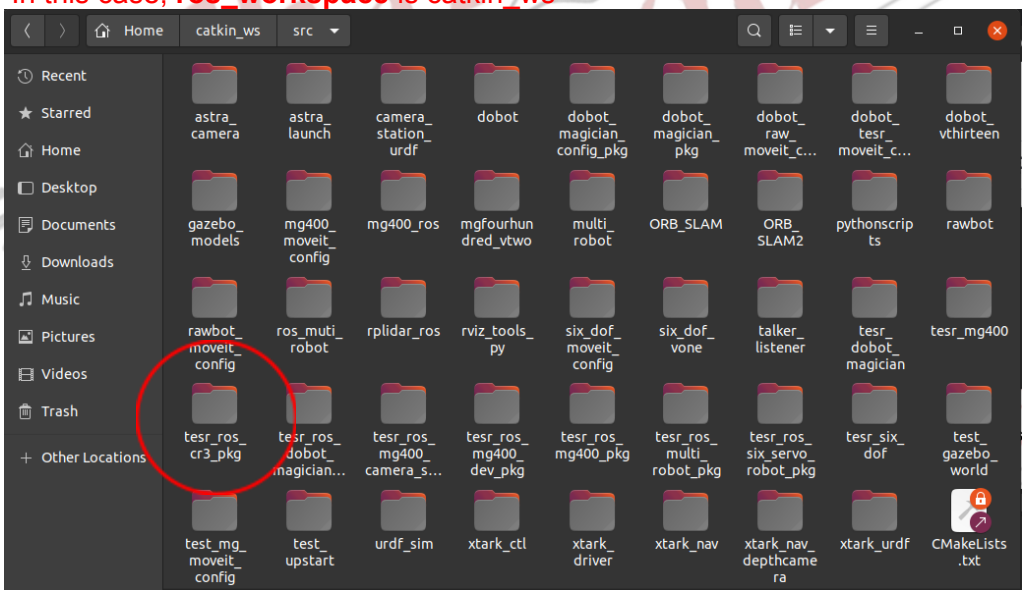
Extract tesr_ros_cr3_pkg.zip file to get tesr_ros_cr3_pkg folder



Step 2

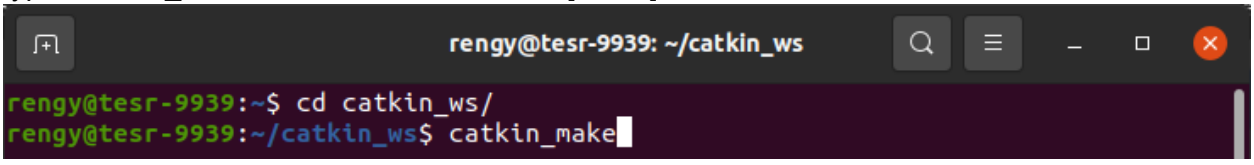
Move tesr_ros_cr3_pkg folder to src of **ros_workspace** catkin_ws/src/

*In this case, **ros_workspace** is catkin_ws



Step 3

Open the terminal and type **"cd catkin_ws"** for change directory to a workspace and type **"catkin_make"** and wait until finish at [100%]



Step 4

Next, change directory by type **"cd catkin_ws/src/tesr_ros_cr3_pkg/scripts"** and type **"ls"** to check the permission of file in scripts. After that, we will see a list of codes with white font.

```
rengy@tesr-9939:~$ cd catkin_ws/src/tesr_ros_cr3_pkg/scripts/
rengy@tesr-9939:~/catkin_ws/src/tesr_ros_cr3_pkg/scripts$ ls
 dobot_api.py                          tesr_cr3_robot_follow_motion.py
 __pycache__                           TESR_CR3_robot_IO_demo.py
 README.md                             TESR_CR3_robot_move_feedback_demo.py
'TESR_CR3_robot_feedback_demo .py'
```

So, we must verify permission to that codes by type:

"sudo chmod +x dobot_api.py tesr_cr3_robot_follow_motion.py TESR_CR3_robot_IO_demo.py TESR_CR3_robot_move_feedback_demo.py TESR_CR3_robot_feedback_demo.py"

```
rengy@tesr-9939:~/catkin_ws/src/tesr_ros_cr3_pkg/scripts$ sudo chmod +x dobot_api.py tesr_
cr3_robot_follow_motion.py TESR_CR3_robot_IO_demo.py TESR_CR3_robot_move_feedback_demo.py
 TESR_CR3_robot_feedback_demo.py
```

After this, type **"ls"** you will see a list of codes with the green font.

```
rengy@tesr-9939:~/catkin_ws/src/tesr_ros_cr3_pkg/scripts$ ls
dobot_api.py  TESR_CR3_robot_feedback_demo.py  TESR_CR3_robot_move_feedback_demo.py
__pycache__   tesr_cr3_robot_follow_motion.py
README.md     TESR_CR3_robot_IO_demo.py
```

Step 5

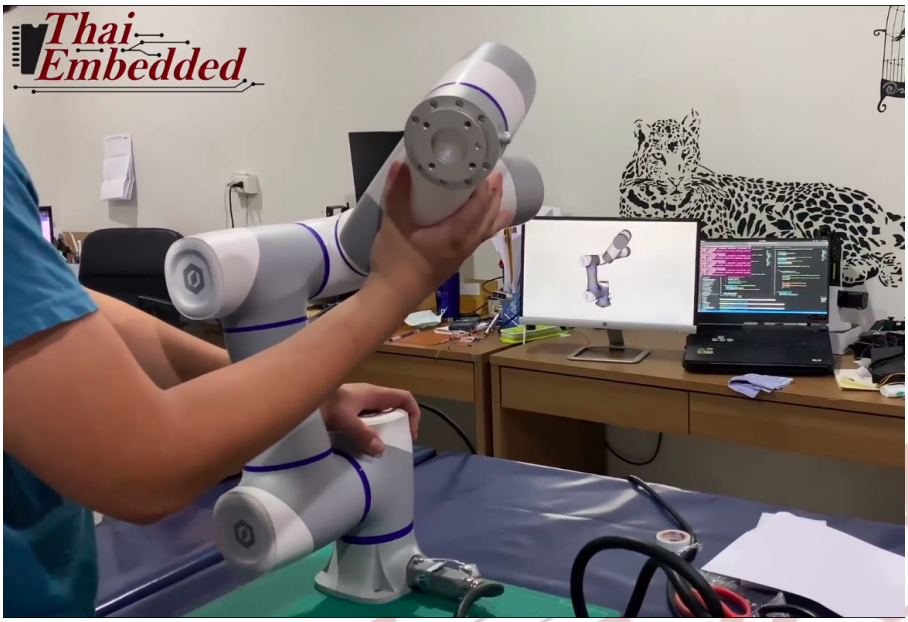
Connect to DOBOT CR3 WiFi by password “1234567890” And then, type "ping 192.168.1.6" on the terminal to check the connection between your PC/Laptop and CR3.

```
rengy@tesr-9939:~$ ping 192.168.1.6
PING 192.168.1.6 (192.168.1.6) 56(84) bytes of data.
64 bytes from 192.168.1.6: icmp_seq=1 ttl=64 time=1.17 ms
64 bytes from 192.168.1.6: icmp_seq=2 ttl=64 time=0.410 ms
64 bytes from 192.168.1.6: icmp_seq=3 ttl=64 time=0.450 ms
64 bytes from 192.168.1.6: icmp_seq=4 ttl=64 time=0.762 ms
64 bytes from 192.168.1.6: icmp_seq=5 ttl=64 time=0.777 ms
```

Step 6

type **"roslaunch tesr_ros_cr3_pkg tesr_cr3_monitoring_rivz.launch"** for monitoring joint states of DOBOT CR3.

```
rengy@tesr-9939:~$ roslaunch tesr_ros_cr3_pkg tesr_cr3_monitoring_rviz.launch
```



========== Enjoy ==========