



Environment setup and installation

Unity – ROS 2



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Prerequisites

- OS
 - Ubuntu 20.04 LTS (recommended)
 - Ubuntu 18.04 LTS (not tested)
- If you don't have Ubuntu on your system
 - Virtual machine (the simulation could be slow)
 - VirtualBox
 - VMware player
 - Partition disk with native Ubuntu
- Clone the repository where you want
 - https://gitlab.com/TrottiFrancesco/mobile_robotics_lab.git



Unity installation



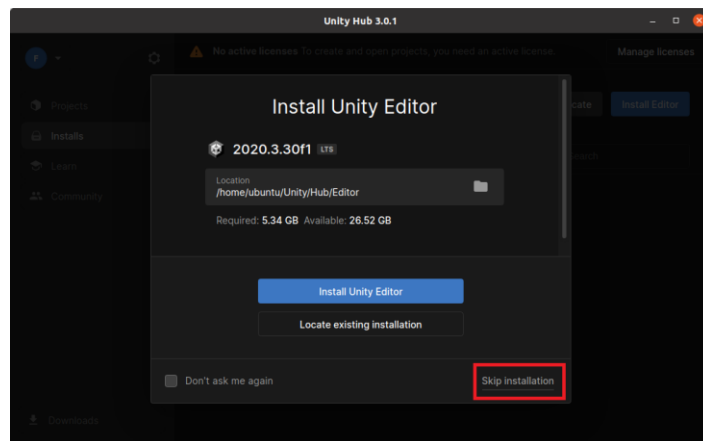
Unity installation

- To install Unity Hub
 - Give the execution permits at the following script
 - run *sudo ./install_unityHub.sh*
- Optional to develop in Unity
 - Install Visual Studio Code
 - Install C# extension for VSC
 - Give the execution permits at the following script
 - run *sudo ./install_mono.sh*



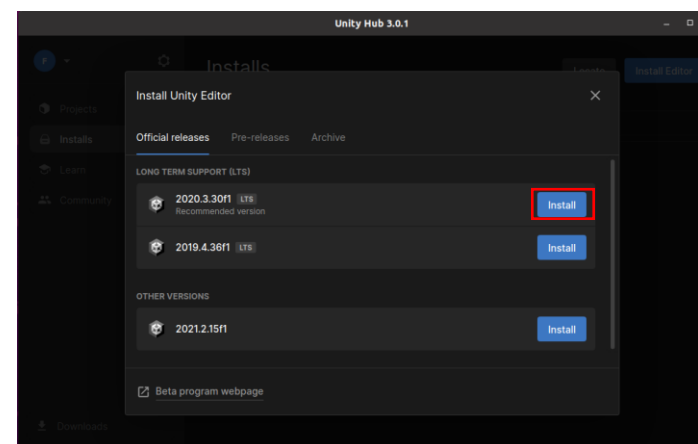
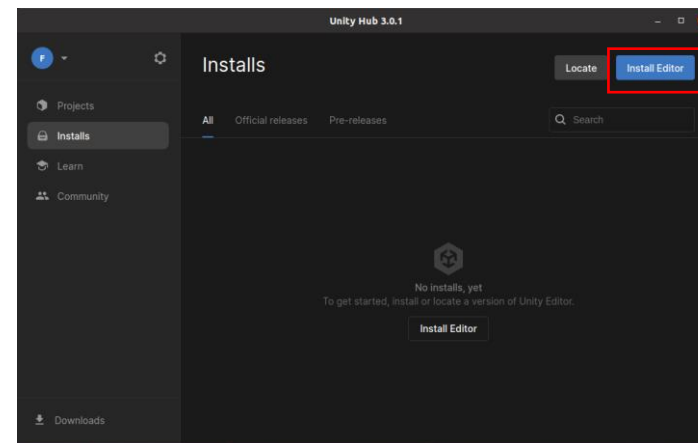
Unity configuration

- Run Unity Hub
 - Create an account if you don't have it
 - Sign-in to Unity Hub
 - In the following window click on *skip installation*



Unity configuration

- Agree the licence
- Now install the correct Unity version
 - Click on *Install Editor*
 - Install the 2020.3.30f1 LTS version
- Now you have Unity installed and configured





ROS 2 installation





ROS 2 installation

- To install ROS 2
 - Give the execution permits at the following script
 - run `./install_ros2_foxy.sh`
 - Reload bashrc file
 - `source ~/.bashrc`
 - If all it's correct in home directory you could find a folder called `colcon_ws`
 - Move in `colcon_ws`
 - Run "`colcon build`" to build the ROS 2 workspace
 - Source the environment
 - `. install/setup.bash`
- ROS 2 is now installed and configured !



ROS 2 Test (Optional)

- To check if ROS 2 is working
 - In one command line exec
 - *ros2 run demo_nodes_cpp talker*
 - Now you are running a publisher node
 - In another command line exec
 - *ros2 run demo_nodes_cpp listener*
 - Now you are running a subscriber node
 - In third command line exec
 - *ros2 topic list*
 - Now you can see the list of active topics
 - */chatter* is the topic where the two nodes are working

```
ubuntu@ubuntu:~/colcon_ws$ ros2 run demo_nodes_cpp talker
[INFO] [1647187400.951565976] [talker]: Publishing: 'Hello World: 1'
[INFO] [1647187401.866613875] [talker]: Publishing: 'Hello World: 2'
[INFO] [1647187402.937075333] [talker]: Publishing: 'Hello World: 3'
[INFO] [1647187403.886544967] [talker]: Publishing: 'Hello World: 4'
[INFO] [1647187405.039652882] [talker]: Publishing: 'Hello World: 5'
[INFO] [1647187405.915613129] [talker]: Publishing: 'Hello World: 6'
[INFO] [1647187406.863496208] [talker]: Publishing: 'Hello World: 7'
[INFO] [1647187407.864572238] [talker]: Publishing: 'Hello World: 8'
[INFO] [1647187408.939177737] [talker]: Publishing: 'Hello World: 9'
[INFO] [1647187409.890787497] [talker]: Publishing: 'Hello World: 10'

ubuntu@ubuntu:~/colcon_ws$ ros2 run demo_nodes_cpp listener
[INFO] [1647187402.937311207] [listener]: I heard: [Hello World: 3]
[INFO] [1647187403.886735008] [listener]: I heard: [Hello World: 4]
[INFO] [1647187405.039885453] [listener]: I heard: [Hello World: 5]
[INFO] [1647187405.915846649] [listener]: I heard: [Hello World: 6]
[INFO] [1647187406.863765961] [listener]: I heard: [Hello World: 7]
[INFO] [1647187407.864831824] [listener]: I heard: [Hello World: 8]
[INFO] [1647187408.939417086] [listener]: I heard: [Hello World: 9]
[INFO] [1647187409.891024132] [listener]: I heard: [Hello World: 10]

ubuntu@ubuntu:~/colcon_ws$ ros2 topic list
/chatter
/parameter_events
/rosout
ubuntu@ubuntu:~/colcon_ws$
```

Uninstallation

- If you want uninstall ROS2
 - Delete the workspace directory
 - `sudo apt remove ~nros-foxy-* && sudo apt autoremove`
 - `sudo rm /etc/apt/sources.list.d/ros2.list`
- If you want uninstall Unity and Unity Hub
 - Delete the project folder
 - `sudo apt-get remove unityhub`



References

- Unity
 - <https://unity.com/>
- ROS 2
 - Installation
 - <https://docs.ros.org/en/foxy/Installation/Ubuntu-Install-Debians.html#>
 - Workspace and Package
 - <https://docs.ros.org/en/foxy/Tutorials/Workspace/Creating-A-Workspace.html>
 - <https://docs.ros.org/en/foxy/Tutorials/Creating-Your-First-ROS2-Package.html>
 - C++/Python3 example
 - <https://docs.ros.org/en/foxy/Tutorials/Writing-A-Simple-Cpp-Publisher-And-Subscriber.html>
 - <https://docs.ros.org/en/foxy/Tutorials/Writing-A-Simple-Py-Publisher-And-Subscriber.html>