

1. <http://wiki.ros.org/kinetic/Installation/Ubuntu>
2. <http://gazebo-sim.org/>
3. Gazebo plugins in ROS  
[http://gazebo-sim.org/tutorials?tut=ros\\_gzplugins](http://gazebo-sim.org/tutorials?tut=ros_gzplugins)
4. Installing gazebo\_ros\_pkgs  
[http://gazebo-sim.org/tutorials?tut=ros\\_installing](http://gazebo-sim.org/tutorials?tut=ros_installing)
5. SDF  
<http://sdformat.org/>

#### Useful Commands:

1. Git clone “[url name from github](#)”
2. [roslaunch tf view\\_frames](#)

#### Keyboard teleop:

[http://wiki.ros.org/teleop\\_twist\\_keyboard](http://wiki.ros.org/teleop_twist_keyboard)  
[https://github.com/ros-teleop/teleop\\_twist\\_keyboard](https://github.com/ros-teleop/teleop_twist_keyboard)  
<https://github.com/lrse/ros-universal-teleop>

#### Topic to explore for next lecture:

##### Mapping

<http://wiki.ros.org/gmapping?distro=kinetic>

##### Transforms

<http://wiki.ros.org/tf>

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**Commands from 8/8/2017 tutorial:**

```
cd catkin_ws/src
```

```
git clone .....
```

```
cd ..
```

```
catkin_ws$ catkin_make
```

```
sudo gedit .bashrc
```

```
source ~/catkin_ws/devel/setup.bash           // add to .bashrc if not already there
```

Ctrl + Shift + T → New Tab

Ctrl + Shift + N → New Terminal

```
roslaunch gazebo_ros gazebo
```

```
roslaunch gazebo_ros spawn_model --file /home/xxxxx/.gazebo/models/create/model-1_4.sdf --sdf --  
model create
```

```
rviz
```

**Commands from 15/8/2017 tutorial:**

[http://wiki.ros.org/slam\\_gmapping](http://wiki.ros.org/slam_gmapping)

<http://wiki.ros.org/navigation/Tutorials/RobotSetup/TF>

To install slam\_gmapping:

```
sudo apt-get install ros-kinetic-slam-gmapping
```

To run slam\_gmapping:

```
roslaunch gmapping slam_gmapping
```

Publish static transform (example):

```
roslaunch tf static_transform_publisher 0 0 0 0.13 0 0.39 base_link laser 100
```

```
roslaunch tf view_frames
```

(<http://wiki.ros.org/tf>)

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### **Commands from 22/8/2017 tutorial:**

<http://wiki.ros.org/roslaunch>

<http://wiki.ros.org/rosbash>

```
roslaunch <package> <executable>
```

```
roslaunch <package> file.launch
```

<http://wiki.ros.org/ROS/NetworkSetup>

```
sudo apt-get install openssh-server
```

```
export ROS_HOSTNAME=localhost
```

```
export ROS_IP=192.168.X.X
```

```
export ROS_MASTER_URI=http://localhost:11311
```