

Linky: Raspberry Pi Zero Configuration

Get Raspberry Pi Zero W Running

Flash SD Card

- 1) Download Raspbian Stretch Lite: https://downloads.raspberrypi.org/raspbian_lite_latest
- 2) Download Etcher
- 3) Flash Raspbian image to MicroSD card with Etcher
- 4) Remove and Reinsert the SD Card

Enable Internet Access (Allow Configuration without Monitor)

Go to the SD Card directory (if on macOS, it is /Volumes/boot/)

```
$ cd Volumes/boot/  
$ touch ssh #Create an empty file to enable SSH  
$ vim wpa_supplicant.conf
```

Place the following content in the file:

```
country=US  
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev  
update_config=1  
  
network={  
    ssid="WIFI_SSID"  
    scan_ssid=1  
    psk="WIFI_PASSWORD"  
    key_mgmt=WPA-PSK  
}
```

Then, place the SD card in the Raspberry Pi, and wait about 90 seconds.

```
ssh pi@raspberrypi.local
```

(Password is raspberry)

Source:

<https://www.losant.com/blog/getting-started-with-the-raspberry-pi-zero-w-without-a-monitor>

Install Tensorflow and Keras

```
$ sudo apt-get update && sudo apt-get upgrade
$ sudo apt-get install python3-pip
$ wget
https://github.com/lhelontra/tensorflow-on-arm/releases/download/v1.8.0/tensorflow-1.8.0-cp35-none-linux\_armv6l.whl
$ sudo pip3 install tensorflow-1.8.0-cp35-none-linux_armv6l.whl
$ sudo pip3 uninstall mock
$ sudo pip3 install mock
$ sudo apt-get install python3-numpy libblas-dev liblapack-dev python3-dev libatlas-base-dev gfortran python3-setuptools python3-scipy
$ sudo apt-get update
$ sudo apt-get install python3-h5py
$ sudo pip3 install keras
```

To test the installation:

```
$ python3
```

```
>>> import tensorflow as tf
>>> print(tf.__version__)
>>> import keras
>>> print(keras.__version__)
```

Source:

<https://medium.com/@abhizcc/installing-latest-tensor-flow-and-keras-on-raspberry-pi-aac7dbf95f2>

Set up RoPi Library

```
$ git clone https://github.com/RoboLinkInc/RoPi
$ pip3 install serial
$ pip3 install picamera
```

Install ROS

Setup ROS Repositories

```
$ sudo apt-get install dirmngr
$ sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release
-sc) main" > /etc/apt/sources.list.d/ros-latest.list'
$ sudo apt-key adv --keyserver hkp://ha.pool.sks-keyservers.net:80
--recv-key 421C365BD9FF1F717815A3895523BAEEB01FA116
$ sudo apt-get update
$ sudo apt-get upgrade
```

Install Bootstrap Dependencies

```
$ sudo apt-get install -y python-rosdep python-rosinstall-generator
python-wstool python-rosinstall build-essential cmake
```

Initializing rosdep

```
$ sudo rosdep init
$ rosdep update
```

Create a catkin Workspace

```
$ mkdir -p ~/ros_catkin_ws
$ cd ~/ros_catkin_ws
$ rosinstall_generator ros_comm --rostdistro kinetic --deps --wet-only --tar
> kinetic-ros_comm-wet.rosinstall
$ wstool init src kinetic-ros_comm-wet.rosinstall
```

Resolve Dependencies

```
$ mkdir -p ~/ros_catkin_ws/external_src
$ cd ~/ros_catkin_ws/external_src
$ wget
http://sourceforge.net/projects/assimp/files/assimp-3.1/assimp-3.1.1_no_test_models.zip/download -O assimp-3.1.1_no_test_models.zip
$ unzip assimp-3.1.1_no_test_models.zip
$ cd assimp-3.1.1
$ cmake .
$ make
```

```
$ sudo make install
$ cd ~/ros_catkin_ws
$ rosdep install -y --from-paths src --ignore-src --rosdistro kinetic -r
--os=debian:stretch
```

Set Up Swap Space

```
$ vim /etc/dphys-swapfile
# Change CONF_SWAPSIZE to 2048
```

Build Catkin Workspace

```
$ sudo ./src/catkin/bin/catkin_make_isolated --install
-DCMAKE_BUILD_TYPE=Release --install-space /opt/ros/kinetic #Took more than
5 hours
$ echo "source /opt/ros/kinetic/setup.bash" >> ~/.bashrc
```

Verify Installation

```
$ python
```

```
>>> import rospy
```

Source:

<http://wiki.ros.org/ROSberryPi/Installing%20ROS%20Kinetic%20on%20the%20Raspberry%20Pi>

Install OpenCV

Use PreCompiled OpenCV

```
$ echo 'deb [trusted=yes] http://dl.bintray.com/yoursunny/PiZero  
stretch-backports main' |\  
sudo tee /etc/apt/sources.list.d/bintray-yoursunny-PiZero.list  
$ sudo apt update  
$ sudo apt install python3-opencv
```

Check Installation

```
$ python3
```

```
>>> import cv2
```

Source: <https://yoursunny.com/t/2018/install-OpenCV3-PiZero/>