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
$ sudo pip3 install imgaug
```

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 Linky Library

```
$ git clone https://github.com/RobolinkInc/Linky
$ 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 --rosdistro 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_tes
t_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/