PyTorch Installation in Raspberry Pi 3

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February 6, 2019

Introduction

Raspbian OS 9 (stretch) in Raspberry pi3 has default python 3.5 and no available wheel for latest version of PyTorch. To run PyTorch, we need to build python 3.6 from the source, create a virtual environment with python 3.6 enabled and install PyTorch 0.4.0 (currently available wheel) through some specific steps.

1 Building Python 3.6

1. Install the required build-tools (some might already be installed on your system).

Command Line

```
$ sudo apt-get update
$ sudo apt-get install build-essential tk-dev libncurses5-dev libncursesw5-dev
$ sudo apt-get install libreadline6-dev libdb5.3-dev libgdbm-dev libsqlite3-dev
$ sudo apt-get install libssl-dev libbz2-dev libexpat1-dev
$ sudo apt-get install liblzma-dev zlib1g-dev
```

2. Download and install Python 3.6. When downloading the source code, select the most recent release of Python 3.6, available on the official site. Adjust the file names accordingly.

Command Line

```
$ wget https://www.python.org/ftp/python/3.6.5/Python-3.6.5.tar.xz
$ tar xf Python-3.6.5.tar.xz
$ cd Python-3.6.5
$ ./configure
$ make
$ sudo make altinstall
```

Use ./configure -enable –optimizations for optimized python 3.6. The build process will take much longer (3-4 hrs), but it would give 10 to 20 percent speed boost.

2 Creating Virtual Environment

1.Install latest version of virtualenv, if not already installed

Command Line

```
$ pip3 install virtualenv
```

2.Create a virtual environment with python 3.6 enabled.

Command Line

```
$ virtualenv -p python3.6 torch
```

3.Activate the virtual environment torch from home directory.

Command Line

```
$ source torch/bin/activate
(torch)pi@raspberrypi $~
```

3 Installing PyTorch

1.First of all, we need to set up SWAP. Edit file /etc/dphys-swapfile, find the constant CONF_SWAPSIZE and change its value to at least 2048, which means sparing 2G for swap file system.

Command Line

```
$ sudo /etc/init.d/dphys-swapfile stop
$ sudo /etc/init.d/dphys-swapfile start
```

2. Install dependencies.

Command Line

```
$ sudo apt-get install libopenblas-dev cython3 libatlas-dev
$ sudo apt-get install m4 libblas-dev cmake
$ sudo apt-get install libjpeg8-dev
$ pip3 install --user pyyaml numpy
```

3. Install PyTorch 0.4.0 from following available wheel in `https://wormtooth.com/files/pytorch/torch-0.4.0a0+3749c58-cp36-cp36m-linux_armv7l.whl`

Command Line

```
$ pip install wheel_link
```

5. Install torchvision.

Command Line

```
$ pip install torchvision
```

Info:

- To check the version of installed PyTorch, run the following command -

Command Line

```
$ python -c "import torch; print(torch.__version__)"
0.4.0
```

- If there are any issues with torchvision installation / Pillow package in torchvision, try to install Pillow separately at first using following command

Command Line

```
$ pip install pillow
```

- As of February, 2019, PyTorch 0.4.0 wheel is available for raspberry pi. Attempts to build a wheel with later version of PyTorch (0.4.1 or 1.0.0) has failed.

-Use latest version of Python 3.6 to create a build for raspbian OS. During configuration, enable optimization if possible. Although It will take much longer to build, the installed python would get a speed boost in slower raspberry pi.