Instructions for setting up development environment for Position Tracking and Stitching

Position Tracking

- Install **Python 2.7** from here: https://www.python.org/downloads/release/python-2714/
Note: remember to download the compatible version of python (32bit or 64bit)

- Download **pip** using https://pip.pypa.io/en/stable/installing. This will also help setup Python to your home path

- After the previous steps, open command prompt and confirm that the following steps don't result in error:
    - python
    - import numpy as np

- Install **matplotlib** using the following command: *pip install matplotlib*. Test for successful installation using: *import matplotlib.pyplot as plt*

- Install **OpenCV** (computer vision package used by us for position tracking) using the following command: *pip install opencv-python*. Confirm installation by *import cv2* in command prompt.

Ensure that you have the following versions setup:

Python - 2.7.6+
Numpy - 1.12.0+
Matplotlib -2.1.1+
Opencv - 3.0.0+

Stitching Codes

- We need to install OpenCV 3.0.0 C++ to run the stitching codes. For setting it up in windows, follow http://docs.opencv.org/3.2.0/d3/d52/tutorial_windows_install.html
- Use the following link to setup OpenCV in Linux: https://www.learnopencv.com/install-opencv3-on-ubuntu/
- While compiling OpenCV, remember to set the TBB (required for multi-threading) and extra_modules_path (has additional feature detection codes) flags:

  ```
  cmake -D CMAKE_BUILD_TYPE=RELEASE -D CMAKE_INSTALL_PREFIX=/usr/local -D OPENCV_EXTRA_MODULES_PATH=/home/rajat/opencv_contrib/modules -D WITH_TBB=ON ..
  ```

Replace '/home/rajat/opencv_contrib/modules' with the path to OPENCV_EXTRA_MODULES_PATH folder.

Running Stitching Codes

- Compile the stitching codes using following command:
  `g++ -std=c++11 StitchedPositionTracking8cam.cpp stitchingUtils.cpp -o StitchedPositionTracking8cam `pkg-config --cflags --libs opencv``
  This allows working on Multithreading

- Be careful not to confuse between OpenCV and Python versions. We have used mostly Python 2.7 and OpenCV 3.0.0 in our codes.

References

https://www.pyimagesearch.com/2015/06/22/install-opencv-3-0-and-python-2-7-on-ubuntu/
https://docs.python.org/2/using/index.html
https://opencv.org/
https://github.com/opencv/opencv
https://github.com/opencv/opencv_contrib
https://www.learnopencv.com/
https://github.com/BurntSushi/nfldb/wiki/Python-&-pip-Windows-installation