Robot speed control using BCI demo – Manual

Prerequisite:

- **Hardware Requirements:**
  - Emotive Insight/EPOC+ Set
  - Lego Ev3
  - Raspberry Pi 3B+
- **Software Requirements:**
  For Laptop:
  - windows 8 or windows 10
  - Internet Explorer
  - Python 3.6
  - .net (version 4 and above)
  - Python module need to be installed: flask*, flask_cors

  For Raspberry Pi: (For Speed control Demo using Ev3)
  - Python 3
  - Python module need to be installed: requests and usb. core
- **Other:**
  - Admin rights
  - USB Enablement

*** Install flask:** Install 'Flask' for windows. Flask can be installed using 'pip install flask' command in Command Prompt (Administrator mode). You can also take help of below link:
https://pypi.org/project/Flask/

Connection details of Lego Ev3 with RPi:

- Please note that Laptop/Desktop (with which BCI is connected) and Raspberry Pi should be in the same network. (Open network is recommended)
- Raspberry Pi has to be powered on through power bank and the EV3 should have 6 AA batteries. Press the middle button of the bricks to switch the EV3 on.
- Connection between Raspberry Pi and EV3 would be **through USB**.
- To open that code on RPi go to that file path(**Desktop/LegoSpeedControlUsingEpoc**) and execute sudo nano speed_control.py
- IP address in speed_control.py needs to be changed based on your desktop's/laptop's IP which would be connected with BCI device. (Don't change the port number and route variable)

Execution:

1st Step:

For Laptop/Desktop:

- Connect BCI device with Laptop/Desktop using Bluetooth stick.
- Press the power button on the Emotiv (BCI) device to switch it on.
- Run 'publish.py' python code on laptop/desktop from the BCI folder (Please refer the shared code). To run the code, go to file path and execute the command 'python publish.py' from command prompt

2nd Step:

For Raspberry pi:

- To run the speed control code, go to the particular folder path (Open terminal and navigate to that path(**Desktop/LegoSpeedControlUsingEpoc**)) where the files are stored and execute the following command-
  sudo python3 speed_control.py

Keyboard interrupt (Ctrl + c/ctrl+z) can be used to stop the code on both Raspberry pi and Laptop/Desktop.