OpenCV Setup on Ubuntu Mate 20

As an intro, we are using Ubuntu Mate 20 as the operating system on the Pi 4 system as it provides a robust environment for supporting AI and applications development. The Pi 4 has been setup to boot from a M.2 NAND SSD which improves speed and overall performance. In the final application, the SSD may be used as a storage device and images flashed to the onboard EMMC. The SSD will improve speed but will add cost to the system.

The Pi camera module driver is installed within the root directory.

```
sudo apt-get install v4l-utils
```

Using the utils can help find connected cameras such as USB and CSI-MIPI.

```
v4l2-ctl --list-formats
v4l2-ctl --list-devices
```

Other linux command for detecting video devices

ls -ltrh /dev/video*

Opencv 4.5.1 has been installed in a virtual environment on the Pi 4 system. The following lines have been added to the user profile on Ubuntu mate.

export WORKON_HOME=$HOME/.virtualenvs
export VIRTUALENVWRAPPER_PYTHON=/usr/bin/python3
source /usr/local/bin/virtualenvwrapper.sh

Whenever development on the Opencv is required and a new terminal opened, the following command is needed to working on the virtualenv.

$ source ~/.profile

Then run the next command

workon cv

At this point, the terminal will change to the virtualenv in which opencv is installed. A sample test program has been made to open and capture video stream from the pi or usb camera depending on which video* is used.

(cv) pi2@pi2:~/opencv/cv_test.py

The above file is the sample code to open and view the camera in a window. Upon pressing the ESC key, the window will close and the file will exit. To run the code, using the command below.

(cv) pi2@pi2:~/opencv/sudo python3 cv_test.py

Sample programs can be found under

(cv) pi2@pi2:~/opencv/samples/