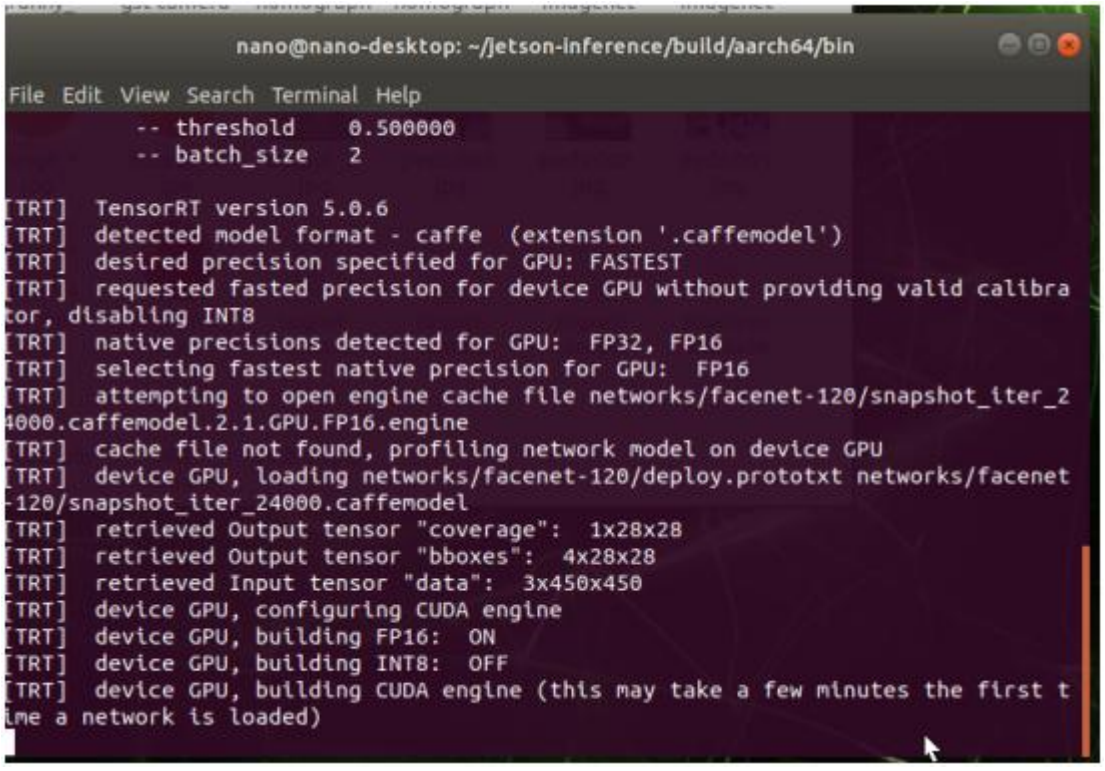
9.Using DetectNet camera Real-time detection

Run the object detection network on the real-time video source of the detectnet-camera Jetson onboard camera. Start it from the command line and the type of network you need:

```
$ ./detectnet-camera facenet          # Running using facial recognition network
$ ./detectnet-camera multiped     # Run using multi-level pedestrian/baggage detector
$ ./detectnet-camera pednet       # Run using original single-level pedestrian detector
$ ./detectnet-camera coco-bottle    # Detect bottle/soda can under the camera
$ ./detectnet-camera coco-dog              # Detecting dogs under the camera
$ ./detectnet-camera                  # By default, the program will run and use
```

Note: To get the best performance when running detectnet, increase the Jetson clock limit by running a script:

sudo ~/jetson_clocks.sh



In the above execution process, each time the first execution is performed, the update model will take a long time. You need to wait patiently, when you want to use it next time, you can use it directly.

Note: By default, Jetson's on-board CSI camera will be used as the video source.

If you want to use a USB webcam,
Similar to the previous detectnet-console example, these camera applications use detection networks, except that they process live video from the camera.
detectnet-camera accepts a variety of optional command line parameters, including:

- - - network flag, which changes the detection model in use (default is SSD-Mobilenet-v2).
- - - overlay flag, which can be a comma-separated combination of box, labels, conf, and none.
- The default value is --overlay = box, labels, conf display box, label and confidence values
- - - alpha sets the value of the alpha blending value to use when overriding (the default is 120).
- --threshold sets the value of the minimum detection threshold (default is 0.5).
- - - camera flag sets the camera device to be used
- Use MIPI CSI cameras by specifying the sensor index (0 or 1 etc.)
- V4L2 USB camera is used by specifying its /dev/video node (/dev/video0, , etc.).
- Default is to use MIPI CSI sensor 0 (--camera = 0)
- - - width and - - height flags set the camera resolution (default is 1280x720)
- Resolution should be set to a format supported by the camera.
- Query the available formats using:

```
$ sudo apt-get install v4l-utils
$ v4l2-ctl --list-formats-ext
```

You can combine these flags as needed, and there are other command line parameters available for loading custom models. Launch the application with the --help flag for more information, or see the Examples readme.

Here are some typical scenarios for start programs:

C ++

```
$ ./detectnet-camera                    #Use PedNet, default MIPI CSI camera（1280×720）
$ ./detectnet-camera --network=facenet  #Use FaceNet, default MIPI CSI camera（1280×720）
$ ./detectnet-camera --camera=/dev/video1  #Use PedNet, V4L2 camera/dev/video1（1280x720）
```

```
$ ./detectnet-camera --width=640 --height=480 #Use PedNet, default MIPI CSI camera（640x480）
```

Python

```
$ ./detectnet-camera.py #Use PedNet, default MIPI CSI camera（1280×720）
$ ./detectnet-camera.py --network=facenet #Use FaceNet, defaultMIPI CSI camera（1280×720）
$ ./detectnet-camera.py --camera=/dev/video1 #Use PedNet, V4L2camera/dev/video1（1280x720）
$ ./detectnet-camera.py --width=640 --height=480 #Use PedNet, default MIPI CSI camera（640x480 ）
```

Visualization

The OpenGL window displays a real-time camera video stream, which covers the bounding box of the detected object. Please note that the current SSD-based models have the highest performance.

This is the one using this coco-dog model:

```
# C ++
$ ./detectnet-camera --network=coco-dog

# Python
$ ./detectnet-camera.py --network=coco-dog
```

If the desired object is not detected in the video feed, or if you get false detection, try using the - - threshold parameter to lower or increase the detection threshold (the default is 0.5).

After executing the first command,we can detect multiple faces. As shown below