12.Camera driver

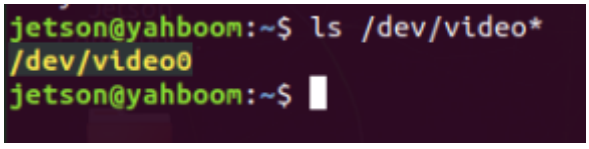
1.Experimental goals

This course mainly uses the motherboard's camera to obtain the camera's picture and display it on the JupyterLab control.

2.Experiment preparation

Check the device number of the USB camera, as shown in the figure below, get the device number /dev/video0

```
ls /dev/video*
```



3.Experiment procedure

Open the jupyterLab client and find the code path:

```
muto/Samples/Control/12.camera.ipynb
```

Import the opencv library and jupyter lab display control.

```
import cv2
import ipywidgets.widgets as widgets
```

Open the camera. The default configuration device is /dev/video0, the display resolution is 640*480, and the frame rate is 30 frames. If the device number of the camera in the system is not /dev/video0, please modify the configuration information according to the actual device number.

```
image_widget = widgets.Image(format='jpeg', width=640, height=480)
image = cv2.VideoCapture(0)
image.set(3, 640)
image.set(4, 480)
image.set(5, 30)
```

Read a frame of image from the camera, ret=True if the reading is successful, ret=False if the reading fails, frame represents the currently read image, calculate the FPS, and display the image on the control.

```
while g_camera.isOpened():
        ret, frame = g_camera.read()
        if not ret:
            print("Camera Read Fail")
            break

        m_fps = m_fps + 1
        fps = m_fps / (time.time() - t_start)
        if (time.time() - t_start) >= 2:
            m_fps = fps
            t_start = time.time() - 1

        text="FPS:" + str(int(fps))
        cv2.putText(frame, text, (10, 20), cv2.FONT_HERSHEY_SIMPLEX, 0.5, (0,
255, 255), 1)
        image_widget.value = bgr8_to_jpeg(frame)
```

If you do not need to use it, please release the camera to avoid errors caused by other routines accessing the camera at the same time. Select the cell displaying the camera and click the stop button to automatically stop and call the camera release program.


```
g_camera.release()
```

4.Experiment summary

This time, the JupyterLab control is used to display the camera screen. If the default device /dev/video0 device number cannot be driven, please check the device number of the current system, or replug and unplug the camera wiring.