Camera driver

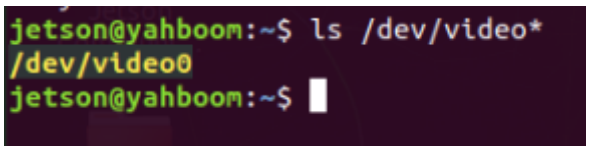
1. Experimental purpose

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

2. Experimental preparation

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

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



3. Experimental process

Open the jupyterLab client and find the code path.

```
jetcobot_ws/src/jetcobot_ai_basic/scripts/1.Camera_Show.ipynb
```

Import the opencv library and the 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. If the reading is successful, ret=True; if the reading fails, ret=False. Frame represents the image currently read.

The FPS is calculated and the image is displayed 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 the camera, please release it to avoid errors caused by other routines accessing the camera at the same time. Select the cell that displays the camera and click the stop button, it will automatically stop and call the camera release procedure.


```
g_camera.release()
```

4. Experimental summary

This time, JupyterLab controls are used to display the camera image. If the default device /dev/video0 cannot be driven, please check the device number of the current system, or replug the camera cable.