

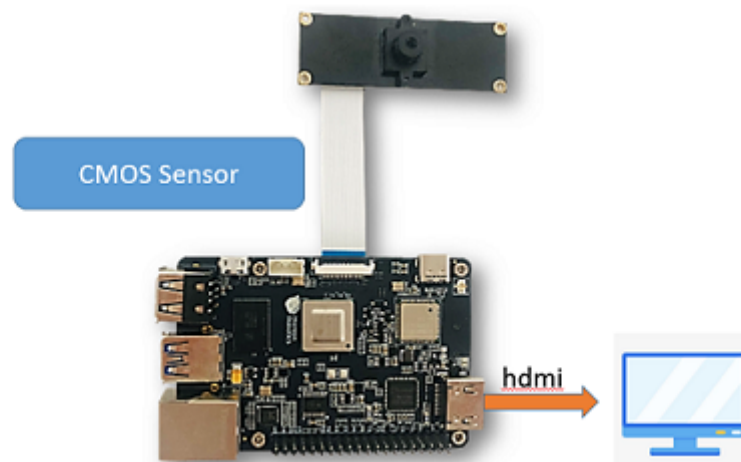
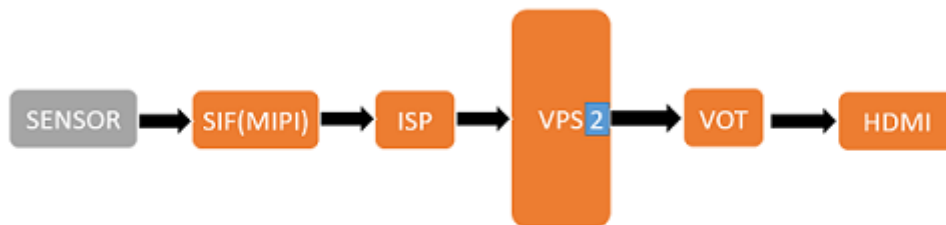
Camera image display

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1. Environment preparation

This example `vio2display` implements the `MIPI` camera image acquisition function and outputs it through the `HDMI` interface. Users can preview the image through the display. The example flow chart is as follows:



- When the development board is powered off, connect the MIPI camera to the development board (with the black side facing the HDMI port).
- Connect the development board and the monitor via an HDMI cable
- Power on the development board and log in to the system

2. How to run

The sample code is provided in source code form. You need to use the `make` command to compile and run it. The steps are as follows.

```
sunrise@ubuntu:~$ cd /app/cdev_demo/vio2display
sunrise@ubuntu:/app/cdev_demo/vio2display$ sudo make
sunrise@ubuntu:/app/cdev_demo/vio2display$ sudo ./vio2display -w 1920 -h 1080
```

Parameter description:

- w: sensor output width
- h: sensor output height

3. Expected results

After the program runs correctly, the development board will output the real-time image captured by the `MIPI` camera through the display.

The running log is as follows.

```
sunrise@ubuntu:/tmp/nfs/sp_cdev/cdev_demo/vio2display$ ./vio2display -w 1920 -
h 1080
disp_w=1920, disp_h=1080
2023/03/28 02:08:03.359 !INFO [x3_cam_init_param][0099]Enable mipi host0 mclk
2023/03/28 02:08:03.359 !INFO [x3_cam_init_param][0099]Enable mipi host1 mclk
Camera: gpio_num=114, active=low, i2c_bus=3, mipi_host=0
Camera: gpio_num=114, active=low, i2c_bus=1, mipi_host=1
Camera: gpio_num=114, active=low, i2c_bus=0, mipi_host=2
Camera 0:
    enable: 1
    i2c_bus: 3
    mipi_host: 0
Camera 1:
    enable: 1
    i2c_bus: 1
    mipi_host: 1
Camera 2:
    enable: 1
    i2c_bus: 0
    mipi_host: 2
cmd=i2ctransfer -y -f 3 w2@0x10 0x0 0x0 r1 2>&1, result=0x02

Found sensor:imx219 on i2c bus 3, use mipi host 0
Setting VPS channel-2: src_w:1920, src_h:1080; dst_w:1920, dst_h:1080;
Setting VPS channel-1: src_w:1920, src_h:1080; dst_w:1920, dst_h:1080;
sp_open_camera success!
libiar: hb_disp_set_timing done!

Press 'q' to Exit !
```