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Step-by-step guide to run Xiaozhi+ face recognition on K230

2025 November

提升社会运行效率 改善人类生活方式

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1. Hardware Environment

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1. One 01Studio K230 development board

2. Camera (GC2093)

3. One touchscreen (ST7701)

4. 3D printer-printed casing

Open source address: https://makerworld.com.cn/zh/models/1273131-canmv_k230_01studio_lcd_ke-_dai-qian-zhi-shuang-mu#profileId-1363542

5. One speaker (with battery or power input)

6. USB to TTL adapter board and DuPont wires (Please note that the serial port must be connected; Linux operating systems use command line operation)

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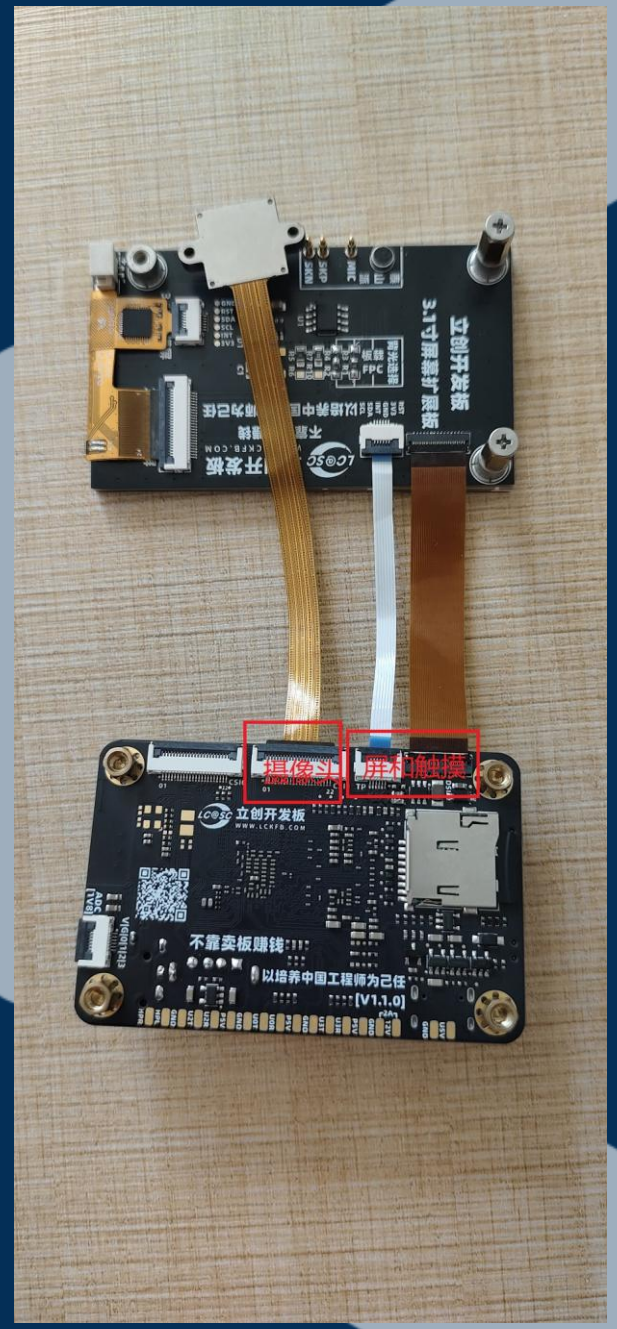
1. A LushanPi K230 development board
2. A camera (GC2093 is used in this demo)
3. A touchscreen
4. An onboard microphone and an external speaker
5. A serial cable
6. A SD card
7. A power cable



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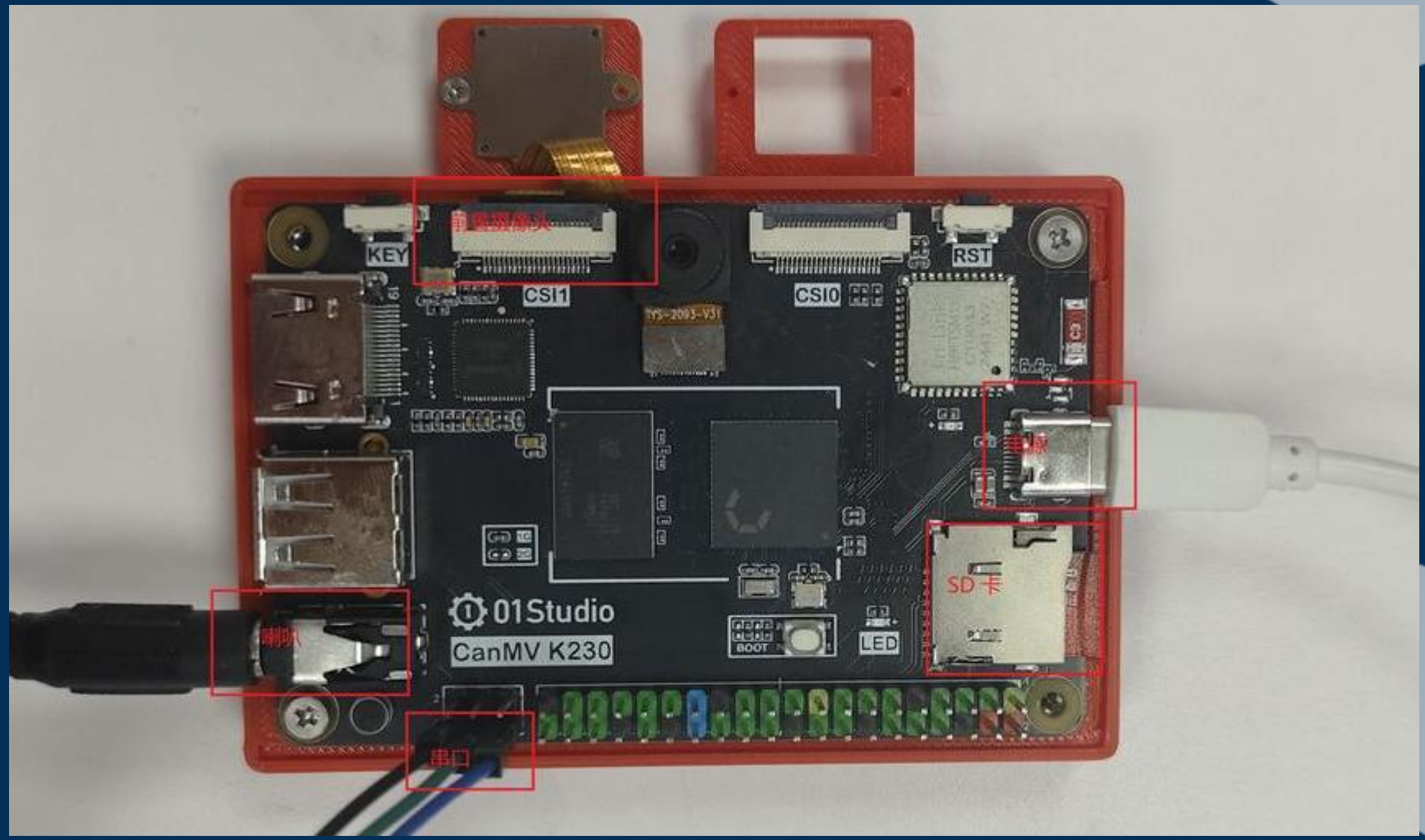
硬件连接图



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2. Software Environment

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1. Direct execution using the official image and bin file.

2. Modify the code and recompile the SDK and bin file.

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Use the official image directly:

- Official image download address

https://www.kendryte.com/zh/resource/software_other,k230

Currently only compatible with 01Studio and LushanPi development board.

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Compile your own image and bin file
Official reference documentation：
https://www.kendryte.com/k230_linux/zh/dev/userguide/how_to_build.html

1）download toolchain
Download : Xuantie-900-gcc-linux-6.6.0-glibc-x86_64-V3.0.2.tar.gz

- Address 1：
https://www.xrvm.cn/community/download?id=4433535576298909696
- Address 2:
https://kendryte-download.canaan-creative.com/k230/downloads/dl/gcc/Xuantie-900-gcc-linux-6.6.0-glibc-x86_64-V3.0.2-20250410.tar.gz

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2）download Linux SDK package，and perform compilation

```
cd ~
mkdir canmv_k230_linux
cd canmv_k230_linux
git clone git@github.com:kendryte/k230_linux_sdk.git
mkdir -p /opt/toolchain
tar -zxvf Xuantie-900-gcc-linux-6.6.0-glibc-x86_64-V3.0.2.tar.gz -C /opt/toolchain
wget -c ruyisdk/riscv-gnu-toolchain-rv64ilp32
mkdir -p /opt/toolchain
tar -xvf riscv64ilp32-elf-ubuntu-22.04-gcc-nightly-2024.06.25-nightly.tar.gz -C
/opt/toolchain/riscv64ilp32-elf-ubuntu-22.04-gcc-nightly-2024.06.25/
sudo apt-get install -y wget git sed make binutils build-essential diffutils gcc g++ bash patch gzip bzip2
perl tar cpio unzip rsync file bc findutils wget libncurses-dev python3 libssl-dev gawk cmake bison flex
bash-completion parted curl xz-utils
cd ~/canmv_k230_linux
make CONF=k230_canmv_01studio_defconfig BR2_PRIMARY_SITE=https://kendryte-download.canaan-
```

3）edit config file， enable below configuration:
LushanPi： k230_linux_sdk/buildroot-overlay/configs/k230_canmv_lckfb_defconfig
01Studio： k230_linux_sdk/buildroot-overlay/configs/k230_canmv_01studio_defconfig

BR2_PACKAGE_WEBSOCKETPP=y
BR2_PACKAGE_BOOST=y
BR2_PACKAGE_BOOST_JSON=y
BR2_PACKAGE_BOOST_LOG=y
BR2_PACKAGE_BOOST_SERIALIZATION=y
BR2_PACKAGE_BOOST_URL=y

4）modify the configuration file in accordance to the camera setup
Reference link：
https://mp.weixin.qq.com/s/P0QOnwfZ87-BmSvppE5I4A

Here, we are using CSI1

5）recompile SDK
cd ~/canmv_k230_linux
make CONF=k230_canmv_01studio_defconfig

6）cloning of Xiaozhi source code and compilation

```
cd ~/canmv_k230_linux/k230_linux_sdk/buildroot-overlay/package
git clone https://github.com/kendryte/xiaozhi_assistant.git

cd ~/canmv_k230_linux/k230_linux_sdk/buildroot-overlay/package/xiaozhi_assistant
./build.sh
```

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Note on the changes:

```
#define SCREEN_WIDTH 480
#define SCREEN_HEIGHT 800
#define SCREEN_ROTATE 270 //90
```

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4. execution

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1）Flashing the firmware

2）Enabling the WiFi

```
ifconfig -a
ifconfig wlan0 up
wpa_supplicant -D nl80211 -i wlan0 -c /etc/wpa_supplicant.conf –B
wpa_cli -i wlan0 scan
wpa_cli -i wlan0 add_network
wpa_cli -i wlan0 set_network 1 ssid '"wifi_test"'
wpa_cli -i wlan0 set_network 1 psk '"12345678"'
wpa_cli -i wlan0 select_network 1
udhcpc -i wlan0 -q
```

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3）copy XiaoZhi executable file to the dev board

//identifying the IP address on dev board
[root@canaan ~]#ifconfig

//execute scp command from the computer
scp -r k230_bin root@192.168.1.102:/root

3）execution

```
//modify screen display to LCD
cd /boot
cp k230-canmv-01studio-lcd.dtb k.dtb
sync
reboot
//test if the display is working properly. Execute the demo below. Note for a rotating square box from display.
vglite_cube
//test if the display is working properly. Check if the camera feed is projecting on the display
v4l2-drm -d 1 -w 480 -h 240

cd /root/k230_bin/
chmod 777 *
./run.sh&
```

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4）activate the device

https://xiaozhi.me/

5）exit application
./stop.sh

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The End

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