14. Yolo hand detection

14.1. Experimental objectives

This lesson mainly studies the hand detection function of K210.

The reference code path for this experiment is: CanMV\05-AI\yolo_hand_detect.py

14.2. Preparation before the experiment

Please confirm whether the sd card model file is imported successfully, the path is: /sd/KPU/yolo_hand_detect/hand_detect.kmodel

14.3. Experimental process

The factory firmware of the module has integrated the AI visual algorithm module. If you have downloaded other firmware, please burn it back to the factory firmware before conducting the experiment.

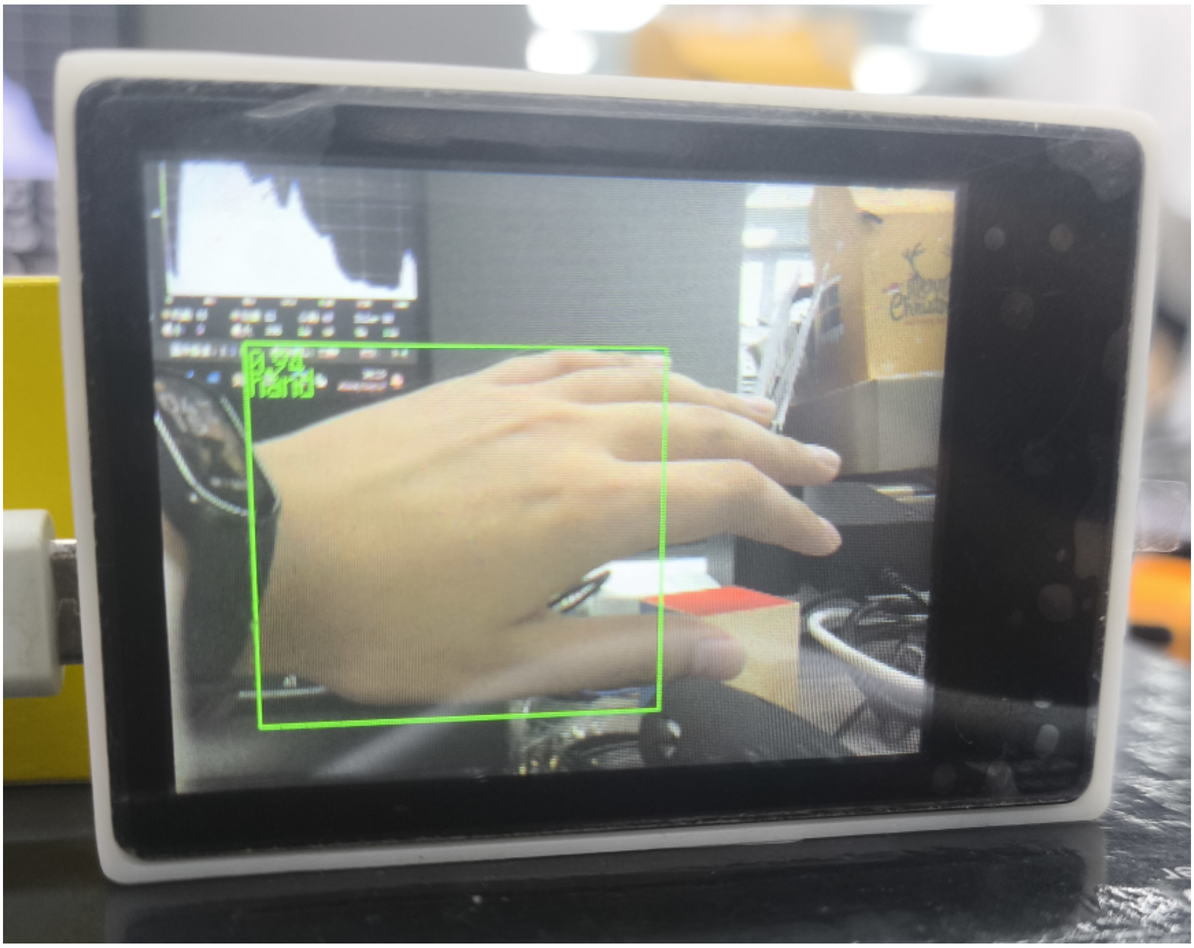
```
lcd.init()
sensor.reset()
sensor.set_framesize(sensor.QVGA)
sensor.set_pixformat(sensor.RGB565)
#翻转屏幕 Flip the screen
#sensor.set_vflip(True)

resize_img = image.Image(size=(320, 256))
anchor = (0.8125, 0.4556, 1.1328, 1.2667, 1.8594, 1.4889, 1.4844, 2.2000,
2.6484, 2.9333)
names = ['hand']

# 创建一个kpu对象 Init a KPU object
hand_detecter = KPU()
# 加载手部检测模型 load hand detect model
hand_detecter.load_kmodel("/sd/KPU/yolo_hand_detect/hand_detect.kmodel")
# 初始化YOLO2 init yolo2
# img_w,img_h为摄像头捕获到的图片原始大小, net_w和net_h为训练模型时使用的图片大小
# img_w and img_h represent the original dimensions of the image
hand_detecter.init_yolo2(anchor, anchor_num=len(anchor) // 2, img_w=320,
img_h=240, net_w=320, net_h=256, layer_w=10, layer_h=8, threshold=0.68,
nms_value=0.3, classes=len(names))
```

```
while True:
        gc.collect()
        img = sensor.snapshot()
        resize_img.draw_image(img, 0, 0).pix_to_ai()
        # 进行KPU运算 Perform KPU calculation
        hand_detecter.run_with_output(resize_img)
        # 进行YOLO2运算 Perform YOLO2 operation
        hands = hand_detecter.regionlayer_yolo2()
        for hand in hands:
            img.draw_rectangle(hand[0], hand[1], hand[2], hand[3], color=(0,
255, 0))
            img.draw_string(hand[0] + 2, hand[1] + 2, "%.2f" % (hand[5]), color=
(0, 255, 0))
            img.draw_string(hand[0] + 2, hand[1] + 10, names[hand[4]], color=(0,
255, 0))
        lcd.display(img)
    hand_detecter.deinit()
    del hand_detecter
    del img
    gc.collect()
```

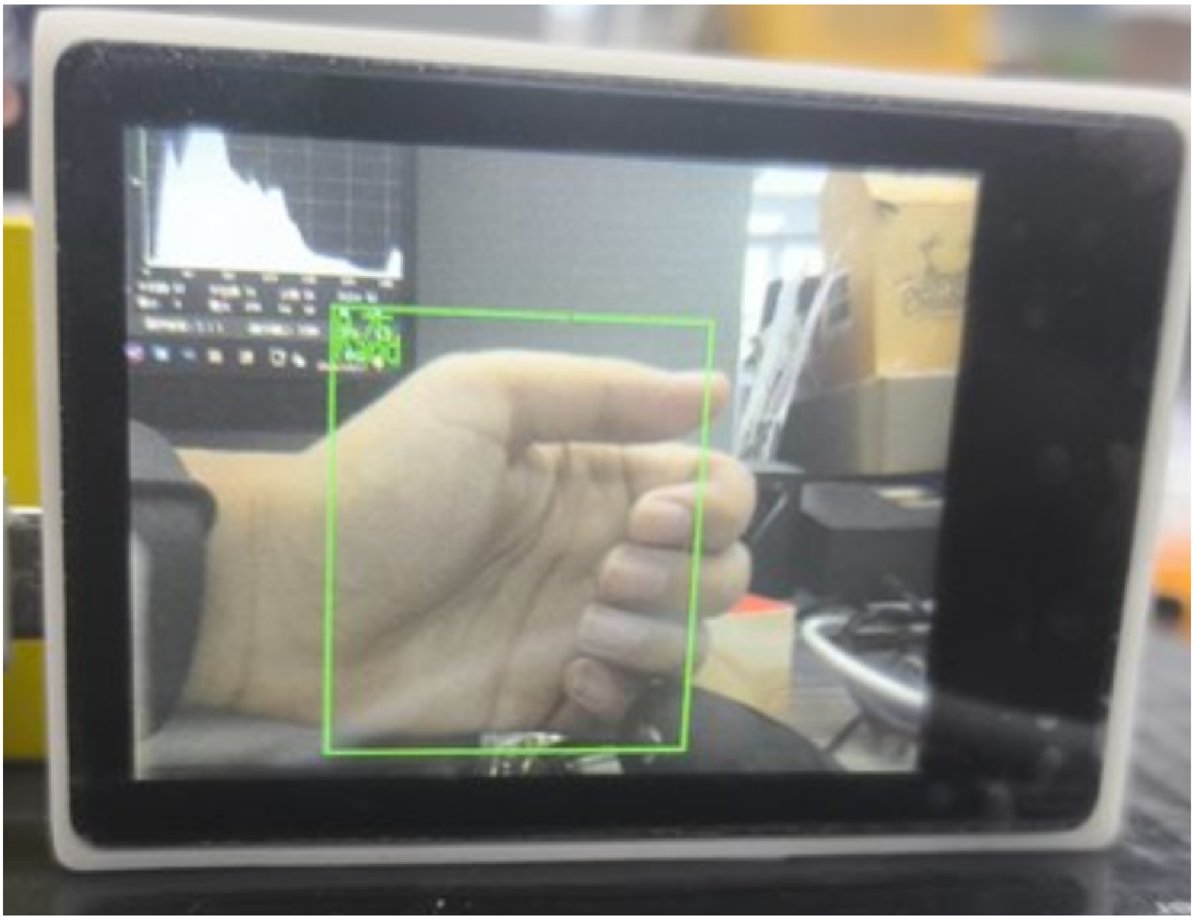
14.4, Experimental results

Connect the K210 module to the computer via a microUSB data cable, click the connection button in CanMV IDE, and click the run button after the connection is completed to run the example code. You can also download the code as main.py to the K210 module and run it.

After waiting for the system to initialize, the LCD displays the camera image, and the human hand appearing on the screen will be marked by a drawn box.



Different hand shapes can be recognized



14.5, Experimental summary

Hand recognition requires a memory card to load the model file, so you need to import the model file into the memory card in advance, and then insert the memory card into the memory card slot of the K210 module. If the model file in the memory card cannot be read, an error will be reported. In this experiment, we learned how to implement the hand detection function based on yolo on the K210 platform. Limited by the model size, the recognition accuracy may be affected