5.7 Object classification (5 flowers)

1. Experiment purpose

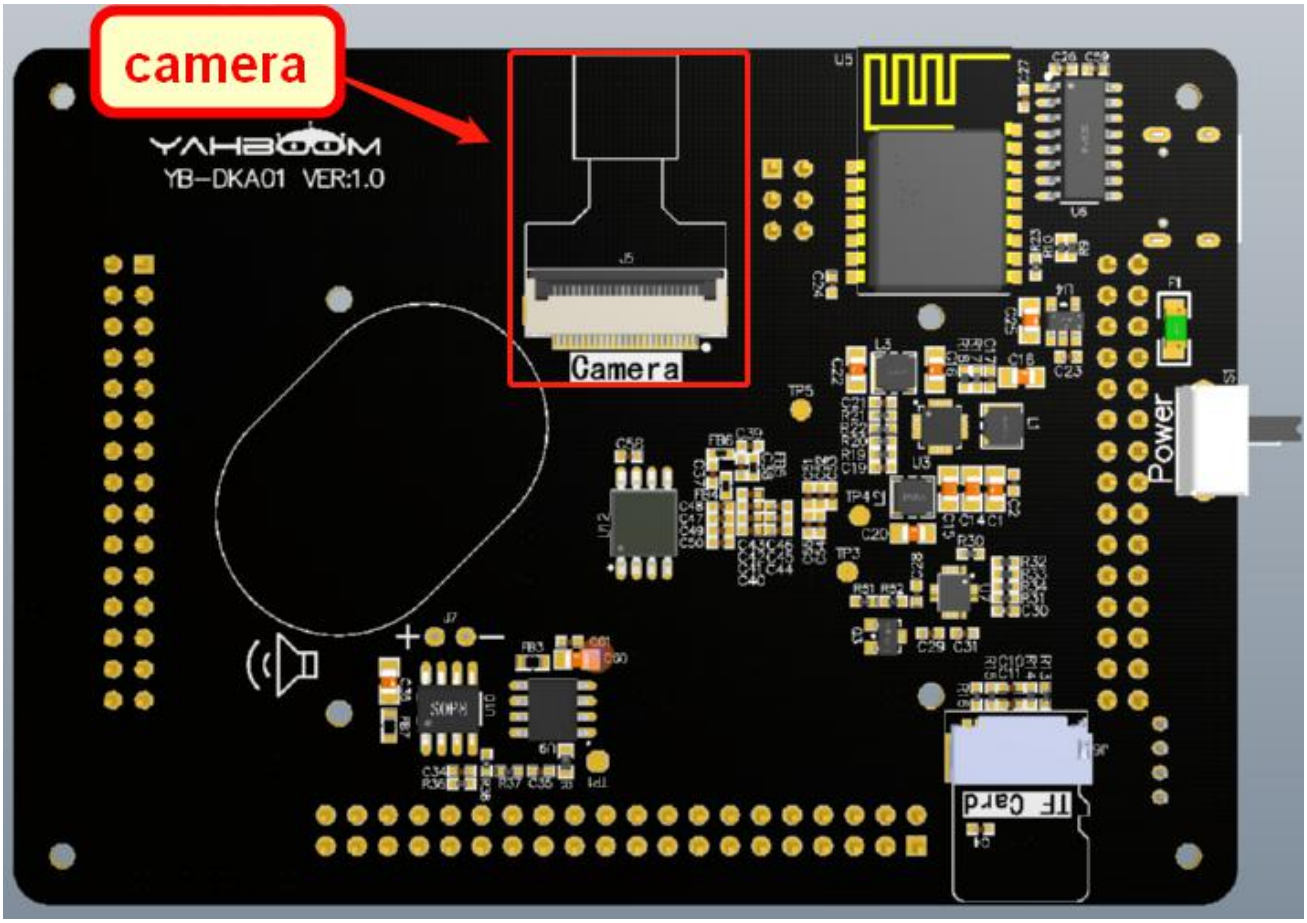
This lesson mainly learns how to use K210 to classify objects, and display the classification name of the current object in real time through LCD.

We uses the PaddlePaddle platform developed by Baidu.

2.Experiment preparation

2.1 components

OV2640 camera, LCD



2.2 Hardware connection

K210 development board has been installed with the camera and display by default. It only needs type-C data line to connect the K210 development board to the computer.

3. Experiment procedure

3.1 Code Procedure

1 - The internal initialization part of the system:

- System clock initialization
- Serial port initialization
- Hardware pin initialization
- IO voltage setting
- System interrupt initialization

- Flash initialization

2 - External hardware initialization

- Lcd initialization
- Ov2640 initialization

Object classification initialization

- Model loading
- Object classification layer configuration initialization

Object classification business logic layer

- Wait for the camera acquisition to complete
- Transfer the images collected by the camera to the KPU running model
- Wait for KPU processing to complete
- Get the final processing result of KPU
- Bring the result of KPU processing into the regional layer to calculate the final label classification result

3.2 The core code

Please view [main.c]

3.3 Compile and debug, burn and run

Copy the object_detection to the src directory in the SDK.

Then, enter the build directory and run the following command to compile.

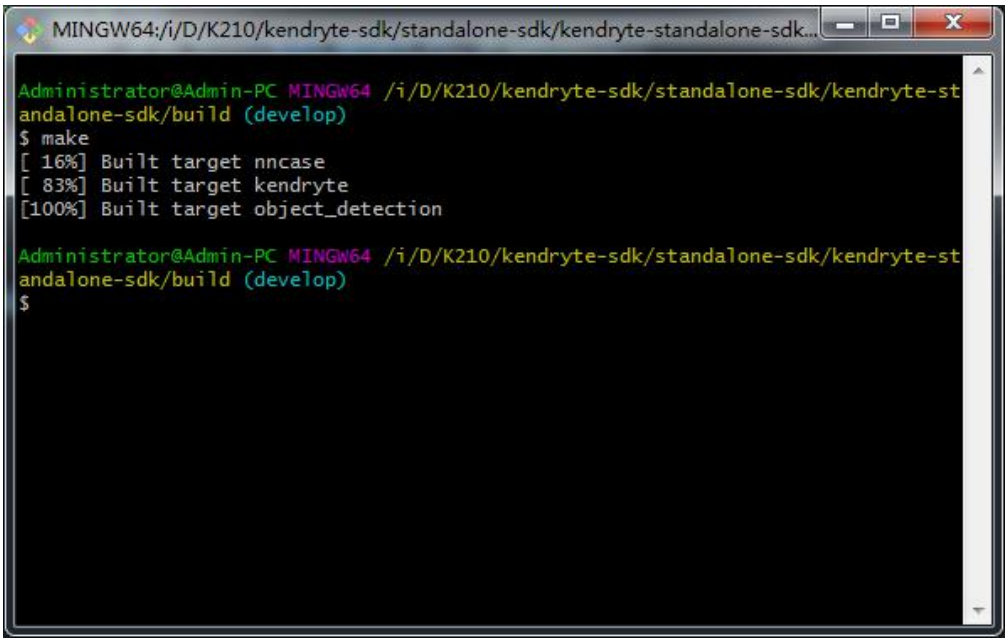
cmake .. -DPROJ=object_detection -G "MinGW Makefiles“

make

After the compilation is complete, the **face_detection.bin** file will be generated in the build folder.

We need to use the type-C data cable to connect the computer and the K210 development board.

Open kflash, select the corresponding device, and then burn the **face_detection.bin** file to the K210 development board.



4. Experimental phenomenon

LCD will display the picture logo and text. After one second, the camera start collect pictures, 5 kinds of flowers will be detected in real time and display the recognition results.

5. Experiment summary

5.1 Object classification uses Baidu artificial intelligence paddlepaddle platform.

5.2 Based on the paddlepaddle platform, the function of object classification can be realized relatively easily.