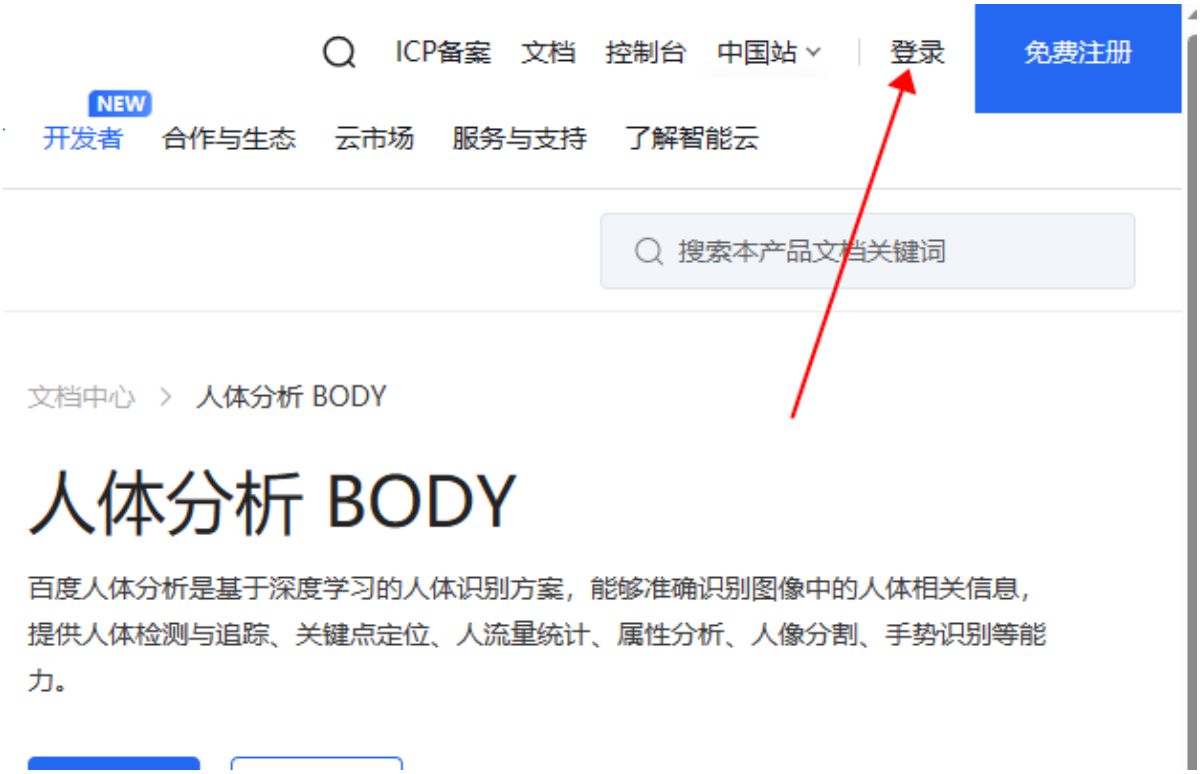
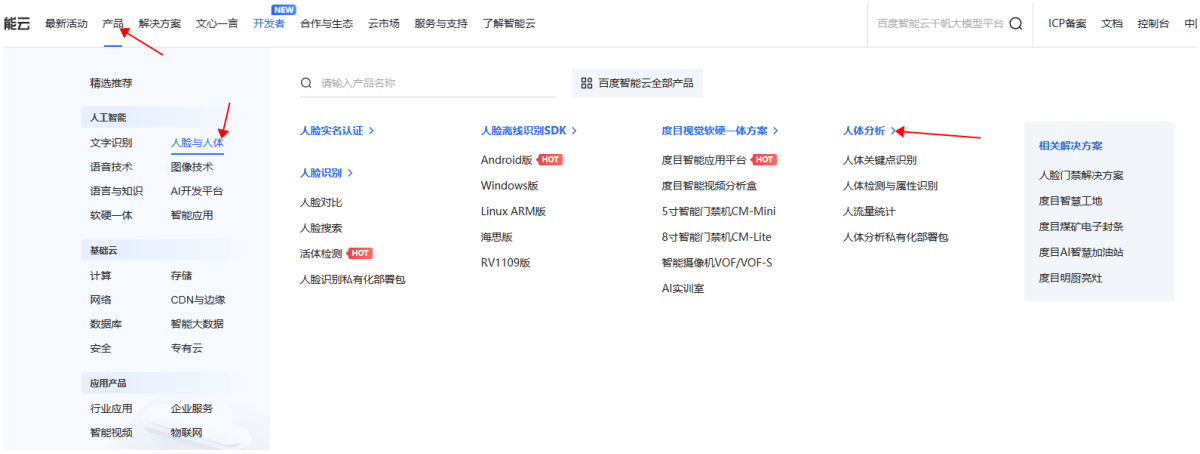
Gesture Recognition

1. Gesture recognition instructions

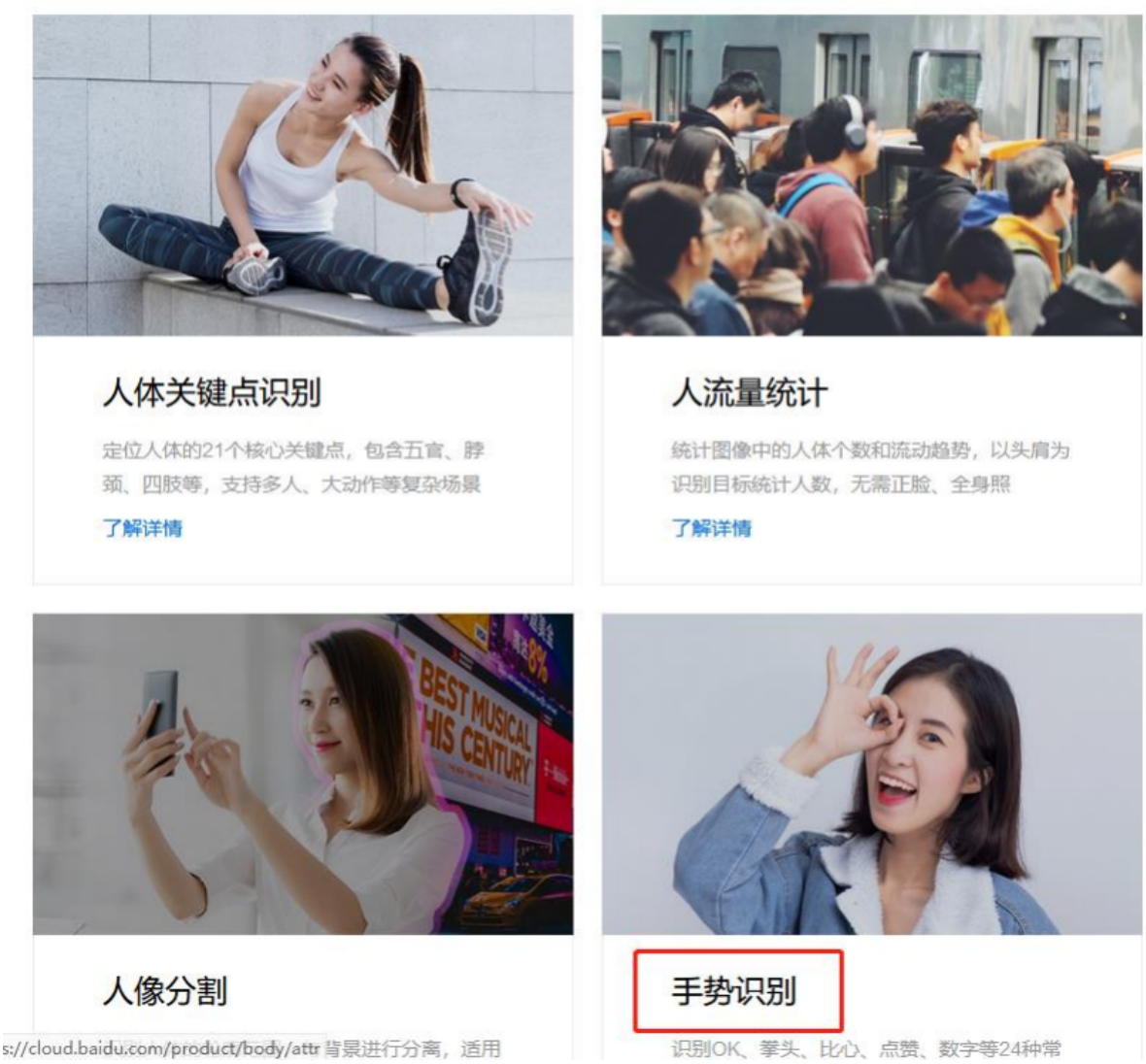
1. The gesture recognition used in this routine is based on the service of Baidu Intelligent Cloud Platform. This service has 50,000 free use opportunities every day. It is only for learning and not for commercial purposes. If you need long-term use, please purchase related services. Our company No responsibility is assumed.
2. Request API description. Official API address reference: https://cloud.baidu.com/doc/BODY/s/ajwvxyyn0. After opening the official API address with a browser, log in to your Baidu account in the upper right corner. If you do not have a Baidu account, please register first.



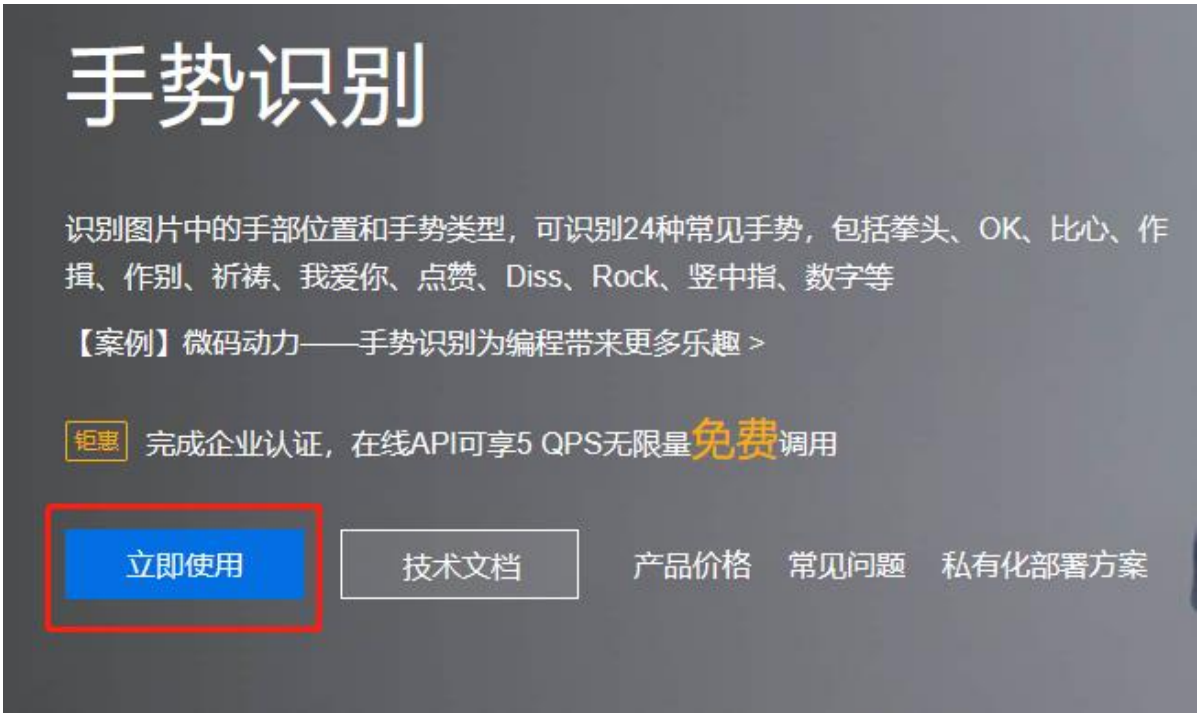
3. After logging in, click 'Products' - 'Artificial Intelligence' - 'Face and Human Body Recognition' - 'Human Body Analysis' on the menu bar.



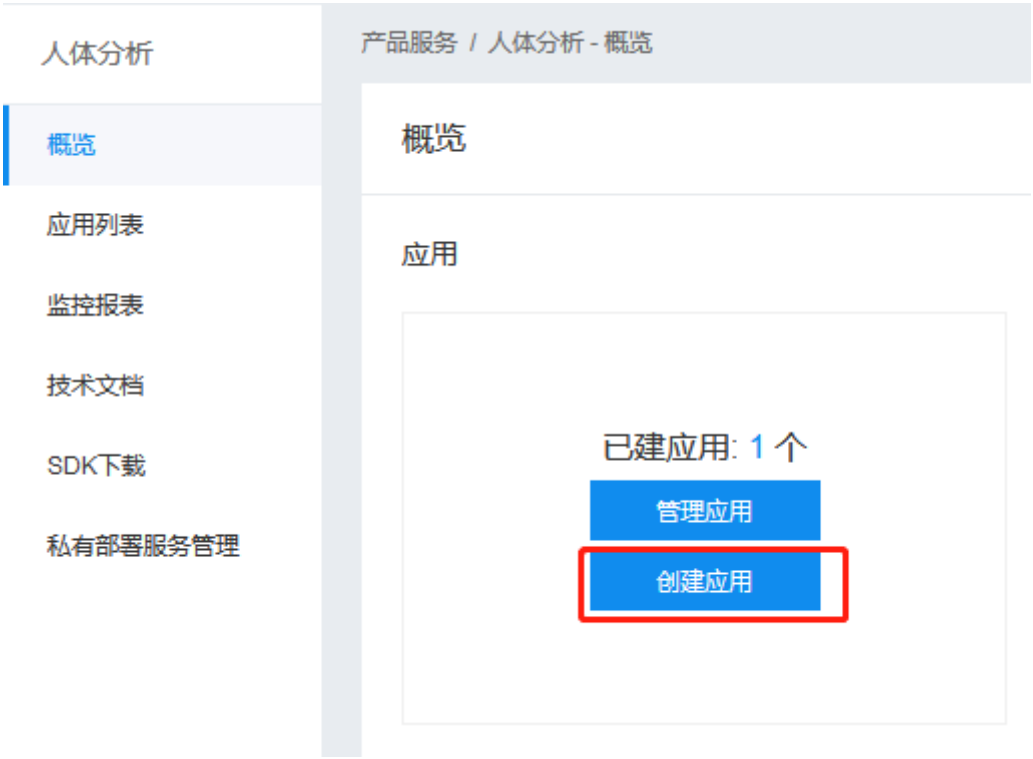
4. Click 'Gesture Recognition' in the product list.



5. Click to use now



6. Next, you will automatically enter the background management of human body analysis, click Create Application



7. After filling in the relevant information, click Create Now. After the creation is completed, click the application list to see the information of the just created application. At this time, copy and save the information under AppID, API Key and Secret Key.

Note: You need to get the free identification quota here. You can select all the functions when you get it

8. Gestures supported by gesture recognition and example images:

序号	手势名称	classname	示例图
1	数字 1（原食指）	One	
2	数字 5（原掌心向前）	Five	
3	拳头	Fist	
4	OK	OK	

序号	手势名称	classname	示例图
5	祈祷	Prayer	
6	作揖	Congratulation	
7	作别	Honour	
8	单手比心	Heart_single	

9	点赞	Thumb_up	
10	Diss	Thumb_down	

序号	手势名称	classname	示例图
11	我爱你	ILY	
12	掌心向上	Palm_up	
13	双手比心 1	Heart_1	
14	双手比心 2	Heart_2	
15	双手比心 3	Heart_3	
16	数字 2	two	

17	数字 3	three	
18	数字 4	four	
19	数字 6	six	
20	数字 7	seven	
21	数字 8	eight	
22	数字 9	nine	

23	Rock	Rock	
24	竖中指	Insult	

9. API functions

```
from aip import AipBodyAnalysis
""" Your APPID AK SK """
APP_ID = 'Your App ID'
API_KEY = 'Your Api Key'
SECRET_KEY = 'Your Secret Key'
client = AipBodyAnalysis(APP_ID, API_KEY, SECRET_KEY)
""" Read pictures """
def get_file_content(filePath):
with open(filePath, 'rb') as fp:
return fp.read()
image = get_file_content('example.jpg')
""" Call gesture recognition """
Res = client.gesture(image);
```

image	是	string	图像数据，base64 编码后进行 urlencode，要求 base64 编码和 urlencode 后大小不超过 4M。图片的 base64 编码是不包含图片头的，如（），支持图片格式：jpg、bmp、png，最短边至少 50px，最长边最大 4096px

Gesture recognition return data parameter details:

字段	是否必选	类型	说明
result_num	是	int	结果数量
result	是	object[]	检测到的目标，手势、人脸
+classname	否	string	目标所属类别，24 种手势、other、face
+top	否	int	目标框上坐标
+width	否	int	目标框的宽
+left	否	int	目标框最左坐标
+height	否	int	目标框的高
+probability	否	float	目标属于该类别的概率
log_id	是	int64	唯一的 log id，用于问题定位

Gesture recognition return example:

```
{
"log_id": 4466502370458351471,
"result_num": 2,
"result": [{
"probability": 0.9844077229499817,
"top": 20,
"height": 156,
"classname": "Face",
"width": 116,
"left": 173
},
{
"probability": 0.4679304957389832,
"top": 157,
"height": 106,
"classname": "Heart_2",
"width": 177,
"left": 183
}
}
```

2. Main code

Code path:/root/Dofbot/6.AI_Visuall/4.Gesture recognition.ipynb

To import Baidu API, the important thing is to change the secret key to the one you applied for.

```
import cv2
import time
```

```
importdemjson
import pygame
from aip import AipBodyAnalysis
from aip import AipSpeech
from PIL import Image, ImageDraw, ImageFont
import numpy
import ipywidgets.widgets as widgets

# For specific gestures, please see the official https://ai.baidu.com/ai-doc/BODY/4k3cpywrv
#Please refer to the official information for specific gestures https://ai.baidu.com/ai-doc/BODY/4k3cpywrv
hand={'One':'Number 1','Two':'Number 2','Three':'Number 3','Four':'Number 4',
       'Five':'Number 5', 'Six':'Number 6', 'Seven':'Number 7',
       'Eight':'Number 8','Nine':'Number 9','Fist':'Fist','Ok':'OK',
       'Prayer':'prayer','Congratulation':'worship','Honour':'farewell',
       'Heart_single':'Comparison','Thumb_up':'Like','Thumb_down':'Diss',
       'ILY':'I love you','Palm_up':'Palm up','Heart_1':'Hands to heart 1',
       'Heart_2':'Hands to heart 2','Heart_3':'Hands to heart 3','Rock':'Rock',
       'Insult':'Middle finger','Face':'face'}

# The following keys should be replaced with your own
#The key below needs to be replaced with one's own
""" HUMAN ANALYSIS APPID AK SK """
APP_ID = '31069241'
API_KEY = 'pxVueLwdAGX4dafYeLsLdZa1'
SECRET_KEY = 'VsDmfGRlWGqzGhcWowoCT5km4TG4Gylq'


client = AipBodyAnalysis(APP_ID, API_KEY, SECRET_KEY)


g_camera = cv2.VideoCapture(0)
g_camera.set(3, 640)
g_camera.set(4, 480)
g_camera.set(5, 30) #Set frame rate
g_camera.set(cv2.CAP_PROP_FOURCC, cv2.VideoWriter.fourcc('M', 'J', 'P', 'G'))
g_camera.set(cv2.CAP_PROP_BRIGHTNESS, 40) #Set brightness -64 - 64 0.0
g_camera.set(cv2.CAP_PROP_CONTRAST, 50) #Set contrast -64 - 64 2.0
g_camera.set(cv2.CAP_PROP_EXPOSURE, 156) #Set exposure value 1.0 - 5000 156.0

ret, frame = g_camera.read()
```

Camera display component

```
image_widget = widgets.Image(format='jpeg', width=600, height=500) #Set the camera display component
display(image_widget)
image_widget.value = bgr8_to_jpeg(frame)
```

Main display and display results program.

```
try:
```

```
while True:
    """1. Take photos """
    ret, frame = g_camera.read()

    #image = get_file_content('./image.jpg')

    """ 2. Call gesture recognition """
    raw = str(client.gesture(image_widget.value))
    text = demjson.decode(raw)
    try:
        res = text['result'][0]['classname']
    except:
# print('Recognition result: Nothing was recognized~' )
# img = cv2ImgAddText(frame, "Unrecognized", 250, 30, (0, 0, 255), 30)
        img = frame
    else:
# print('Recognition result: ' + hand[res])
# img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)
        if res == 'Prayer': # 1 Prayer
            print('Recognition result: ' + hand[res])
            img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)

        elif res == 'Thumb_up':# 2 Likes
            print('Recognition result: ' + hand[res])
            img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)

        elif res == 'Ok': # 3 OK
            print('Recognition result: ' + hand[res])
            img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)

        elif res == 'Heart_single': # 4 Compare your heart with one hand
            print('Recognition result: ' + hand[res])
            img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)

        elif res == 'Five': # 5 number 5
            print('Recognition result: ' + hand[res])
            img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)

        elif res == "Eight": # Number 8
            print('Recognition result: ' + hand[res])
            img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)

        elif res == "Rock": # rock
            print('Recognition result: ' + hand[res])
            img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)

        elif res == "Congratulation": # Make a bow
            print('Recognition result: ' + hand[res])
            img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)

        elif res == "Seven": # Number 7
            print('Recognition result: ' + hand[res])
            img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)

        elif res == "Thumb_down": # Thumb down
```

```
                print('Recognition result: ' + hand[res])
                img = cv2ImgAddText(frame, hand[res], 250, 30, (0, 255, 0), 30)
            else:
                img = frame
        image_widget.value = bgr8_to_jpeg(img)
except KeyboardInterrupt:
     print("Program closed! ")
     pass
```

After the code block is run, you can see the recognition screen. **Note, if you cannot identify Baidu, apply for your own secret key.**