Chapter9: Voice broadcast using Raspberry Pi

1.1Configure the Raspberry Pi voice development environment

Preparation: The BST-AI expansion board is equipped with a 3.5mm headphone holder and a xh2p connector that can be equipped with a speaker. The aux dual-head 3.5 audio cable is used to connect the expansion board and the Raspberry Pi, and the speaker is need to be inserted into the expansion board 2pin connector correctly.

Our goal is to use the Raspberry Pi for speech synthesis and broadcast. After the connection is completed, we can test the hardware function.

We need to input this command at the terminal:

```
aplay /usr/share/sounds/alsa/*
```

As shown figure1-1 below.

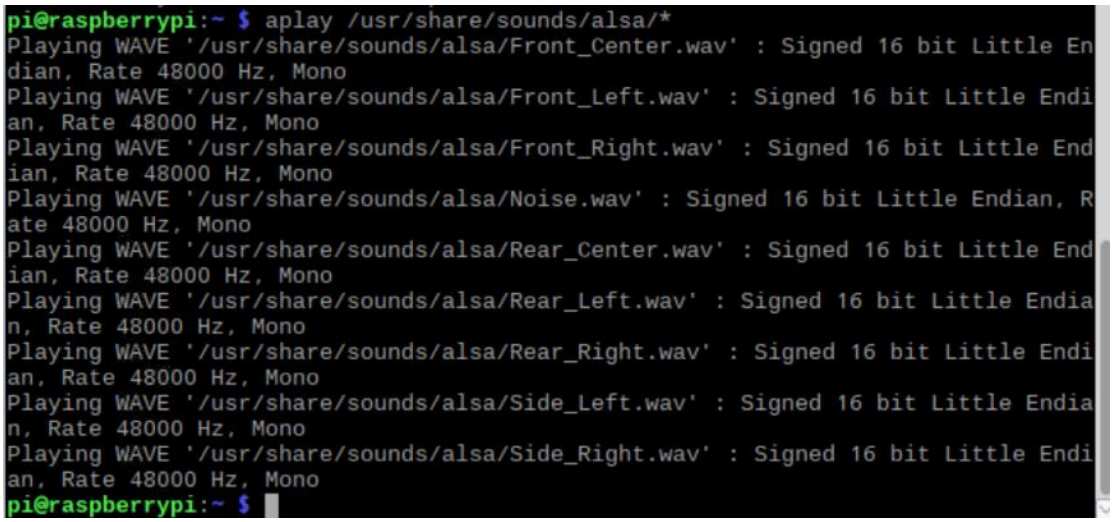

Figure 1-1

If there is no sound, check if the audio driver is turned on.

We need to input this command at the terminal:

```
sudo raspi-config
```

Select “Advanced Options”->”Audio”->”1 Force 3.5mm (‘headphone’) jack”

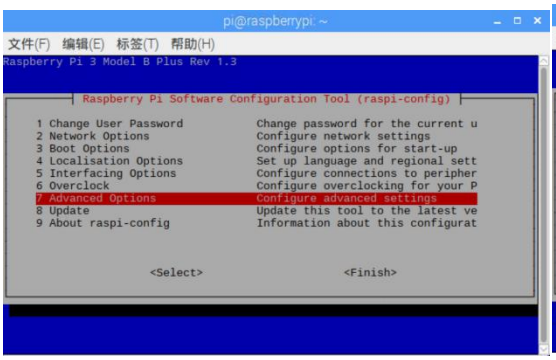

Figure 1-2 step1: Advance Option

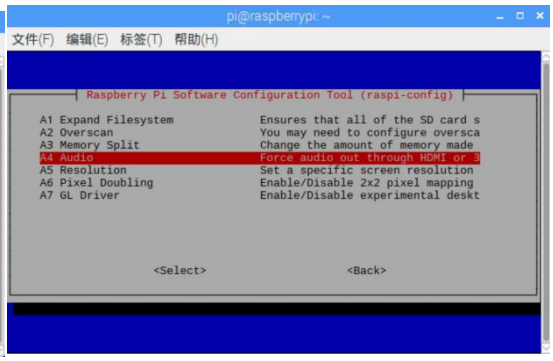

Figure1-3 step2: Audio

Figure 1-4 step3: Force 3.5mm (‘headphone’) jack

The simplest way to handle the Raspberry Pi is espeak. We need to input this command at the terminal:

```
sudo apt-get install espeak
```

As shown figure1-5 below.

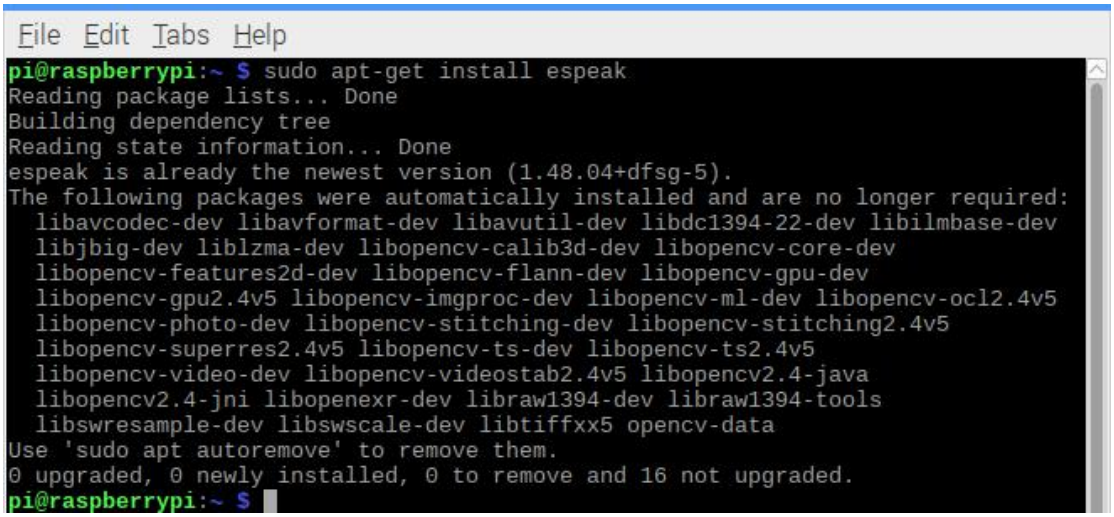

Figure 1-5 Install espeak

After the download is complete, it can be used in the terminal. The infrastructure is:

```
espeak “What the Raspberry Pi wants to say”
```

Parament：

-ven+m1/f1: Change the voice, the parameter ‘m’ is the male voice, ‘f’ is the female voice, and the two voices possess the four tones of 1, 2, 3, 4.
-g10/-s250: These two methods can change the speech rate, ‘-g’ stands for pause between words, ‘10’ stands for 10ms, and ’-s’ stands for the average number of times per minute.

For example：

```
espeak -ven+f1 -g180 “hello raspberry pi”
```

The meaning of this command is: broadcast "hello raspberry pi" in the English pronunciation of the girl, each word is 180ms.

1.2 Using the Baidu Voice API

First, you need to apply for your own Baidu AI developer account, install the SDK (Software Development Kit, Software Development Kit).

We should input this link on the browser of the Raspberry Pi：

http://ai.baidu.com/tech/speech, click 【Console】. As shown figure1-6 below.

!!!Note: The operations are done by opening the browser on the Raspberry Pi.

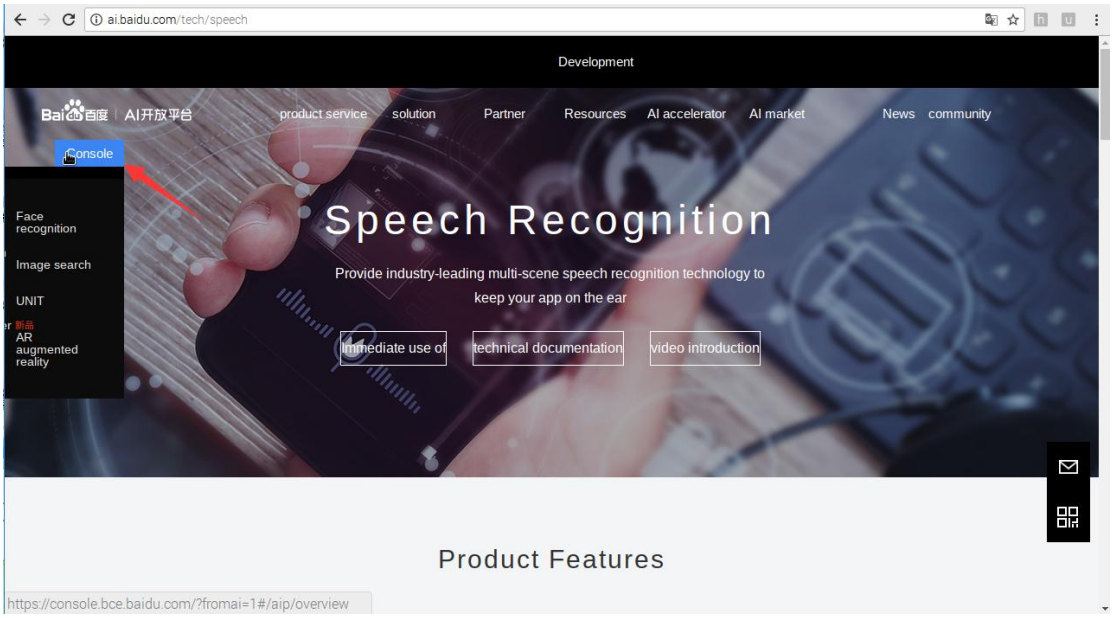

Figure1-6

Enter the login page, user who do not have a Baidu cloud account need to complete the registration. After completing the login, you may be fill out a form. As shown figure1-7 and 1-8 below.

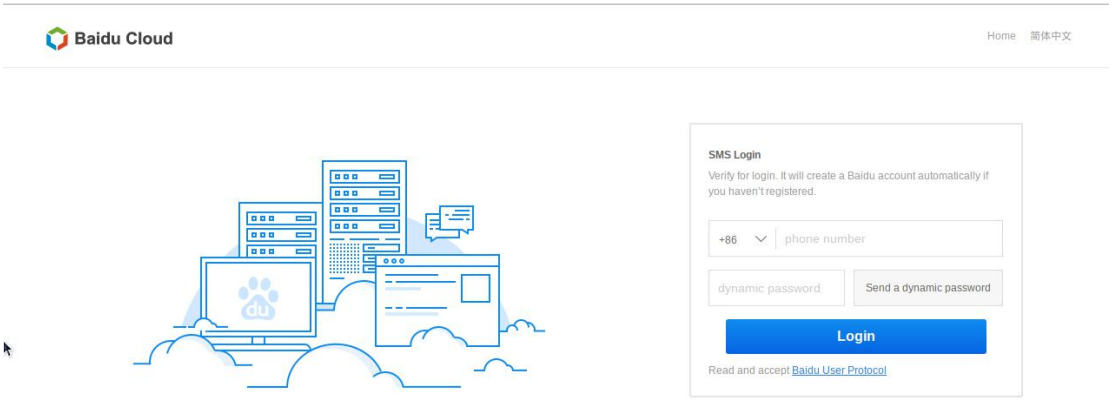

Figure1-7

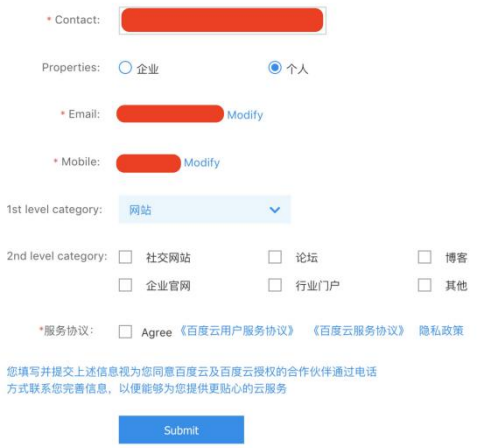

Figure1-8 Fill your message

After submitting,enter Baidu Cloud Product Overview, and find "Baidu Voice" and enter.

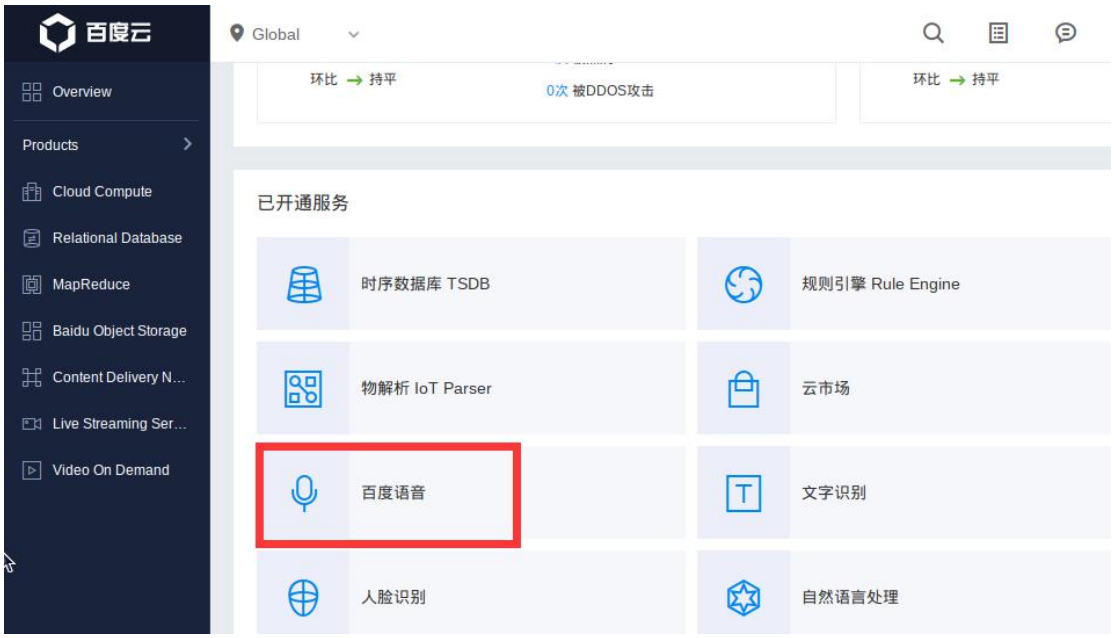

Figure1-9 find "Baidu Voice

You can see that the current number of our application is 0, click "create application".

Figure1-10 "create application"

We create an application, the type can be filled in "learning office". As shown figure1-11 below.

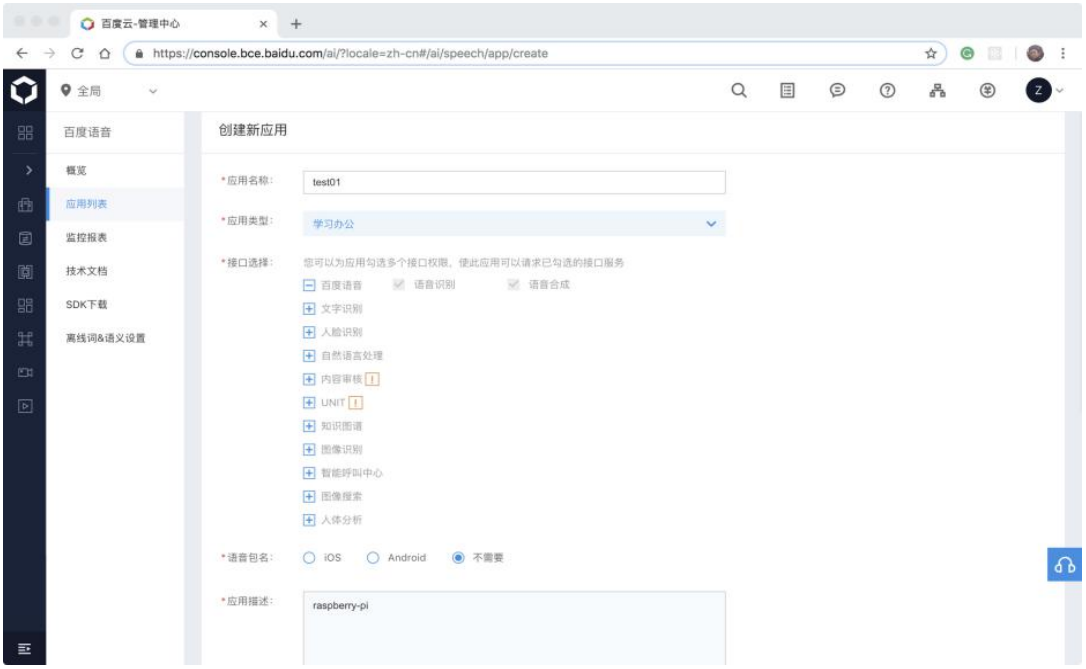

Figure1-11

After the creation is completed, return to the previous "Baidu Voice" interface, you can see that the application has been generated, and at the same time generate an appID, and two key values, these will be used in later development. As shown figure1-12 below.

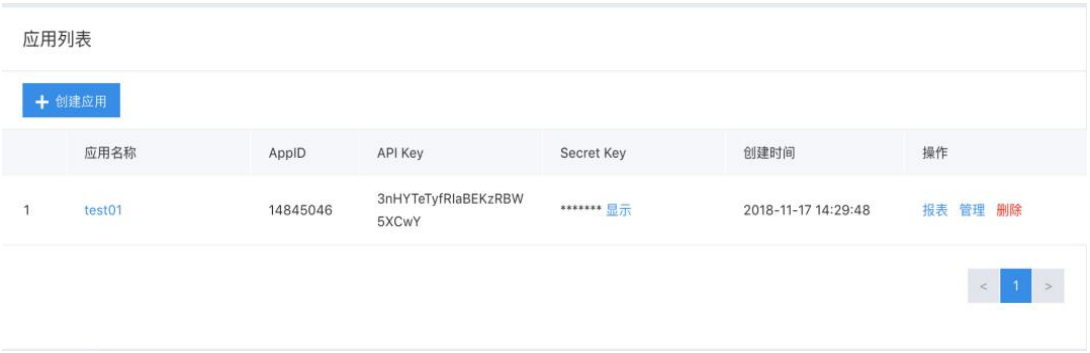

Figure1-12

Next, we need to download Baidu Voice's python-SDK. The browser goes to https://ai.baidu.com/sdk#asr or finds the "SDK Download" button on the page. Because the software development language of our suite is python, we need to found and downloaded python-SDK.

!!!Note: The above operations are all done by opening the browser on the Raspberry Pi.

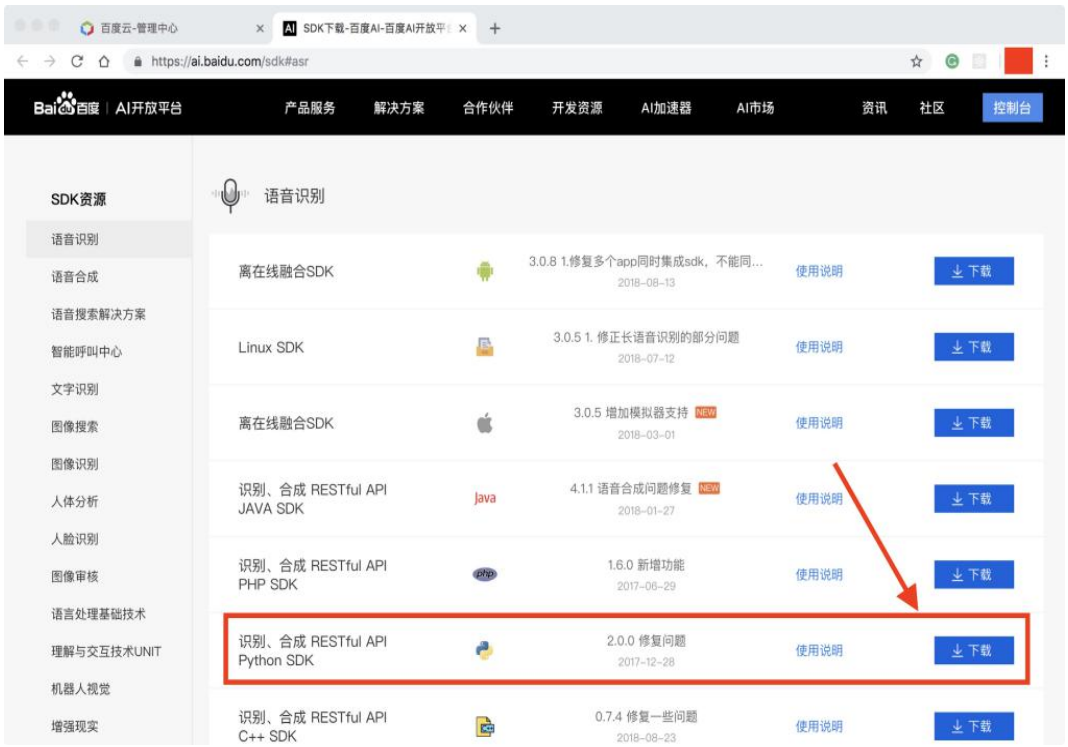

Figure1-13

We need to put this soft package into /home/pi, and input this command at the terminal:

```
unzip aip-python-sdk-2.0.0.zip
```

The meaning of this command is: extract aip-python-sdk-2.0.0.zip, After the decompression is completed, a folder named "aip" is automatically generated in the current directory.

Next, we need to input this command at the terminal:

```
sudo pip install baidu-aip
```

Before experimenting we need to test, input from aip import AipSpeech in the spyder console, if there is no abnormality, the download is successful. As shown in the figure below. As shown figure1-14 below.

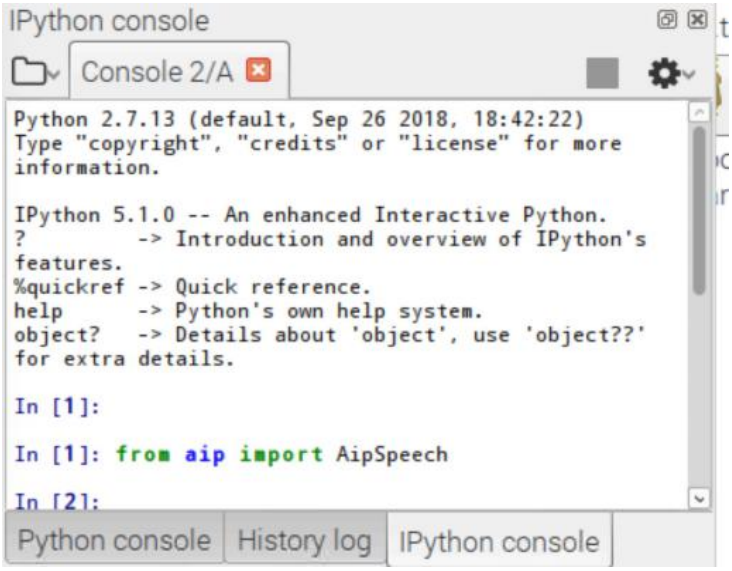

Figure1-14

We will learn Baidu speech by a simple program of speech recognition and a speech synthesis. In other words, we need two sets of developer tools, so we should generate an application on the browser again.

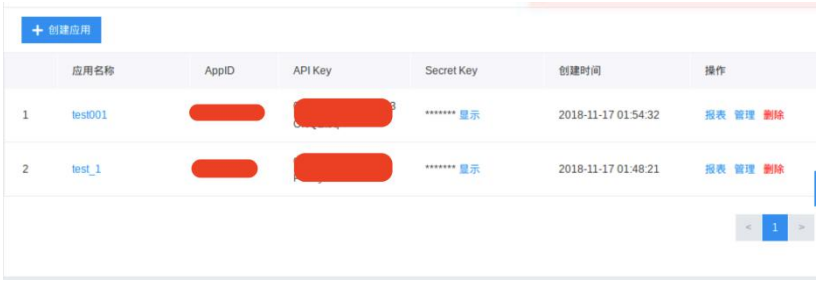

Figure 1-15

In the next chapter, we will take advantage of the two applications.