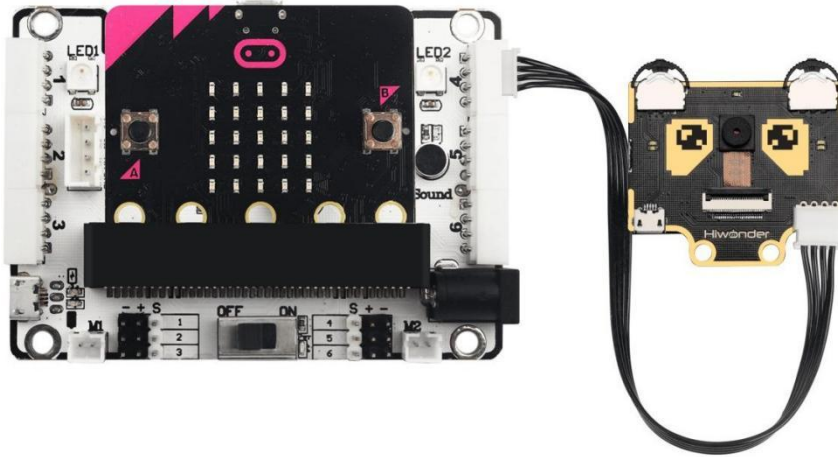# Lesson 7 Image Classification Integration with micro:bit

1. Preparation

Connect WonderCam to micro:bit Expansion Board Port 4.

2. Learning Objective

① To know the connectivity of WonderCam on micro:bit Expansion Board

② To understand the program logic.

3. Programming Plan

In this lesson, we will integrate the Vision module Image Classification function with the output from micro:bit Expansion Board. The program will first initialize the Vision module following by detecting features, classifying images and presenting results on the micro:bit Dot Matric Display.
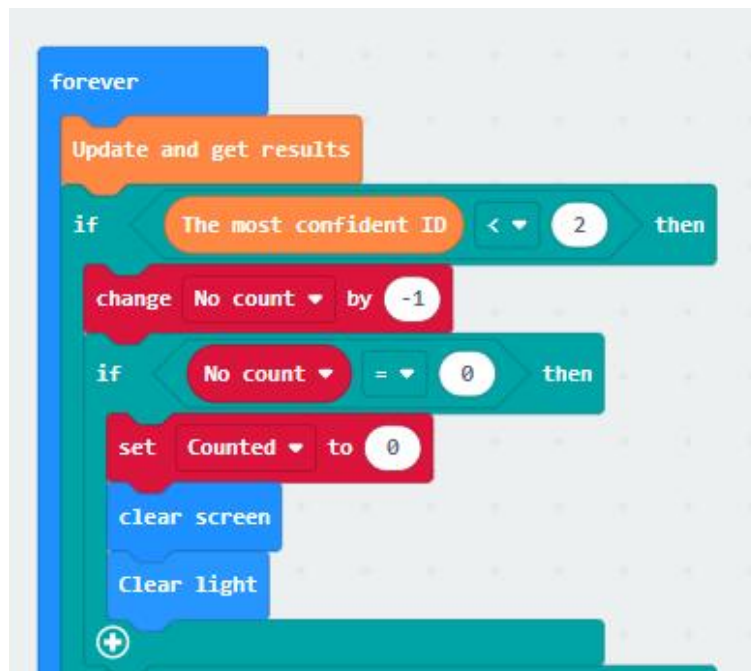
4. Programming

◆ **Adding Extension**

Go to https://makecode.microbit.org/ and create New Project. In the MakeCode Toolbox, select Advanced, click on Extensions to add the following

two extension packs:

https://github.com/hiwonder/wondercam

https://github.com/Hiwonder/Startbit

◆ **Command Blocks**

```
else                                              ⊖

    if      Last result ▼  = ▼   The most confident ID    then

    change  Counted ▼  by   1

    if      Counted ▼  = ▼   5     then

        play tone  High E  for  1/4 ▼  beat

        if      Last result ▼  < ▼   5    then

            Set  All ▼  color to  red ▼

            Show light

            show string  "H"

        else if    Last result ▼   < ▼   8    then ⊖

            Set  All ▼  color to  blue ▼

            Show light

            show string  "R"

        else if    Last result ▼   < ▼   11   then ⊖

            Set  All ▼  color to  green ▼

            Show light

            show string  "W"

        else                                      ⊖

            Set  All ▼  color to  white ▼

            Show light

            show string  "D"

        ⊕

        set  No count ▼  to   15
```
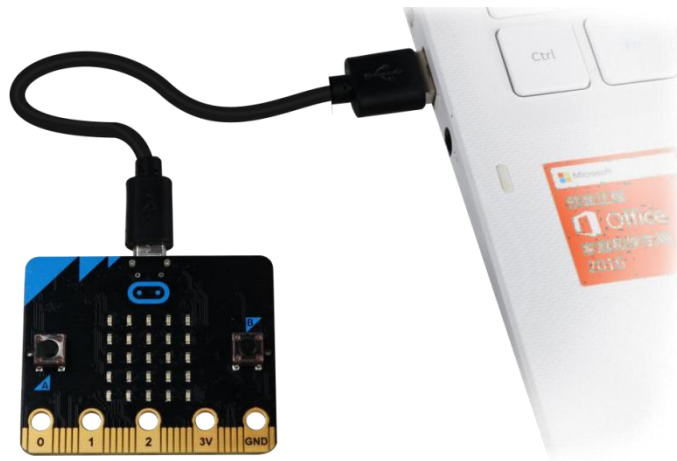
4.1 Pairing devices and program download

1）Connect micro:bit to computer.

2) Click on "…" located beside"Download" and select "Pair device".

3) Click on on "Pair device" on the Pop-up screen.

Pair device for one-click downloads ✕

1 **Connect the micro:bit to your computer with a USB cable**
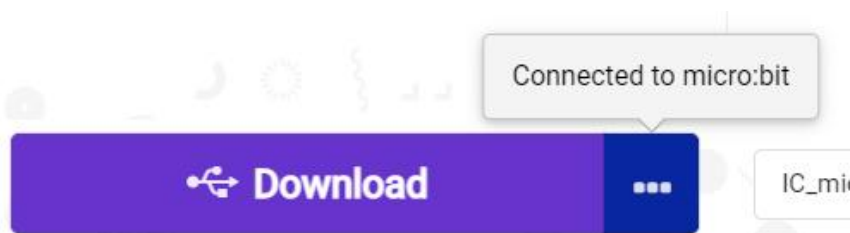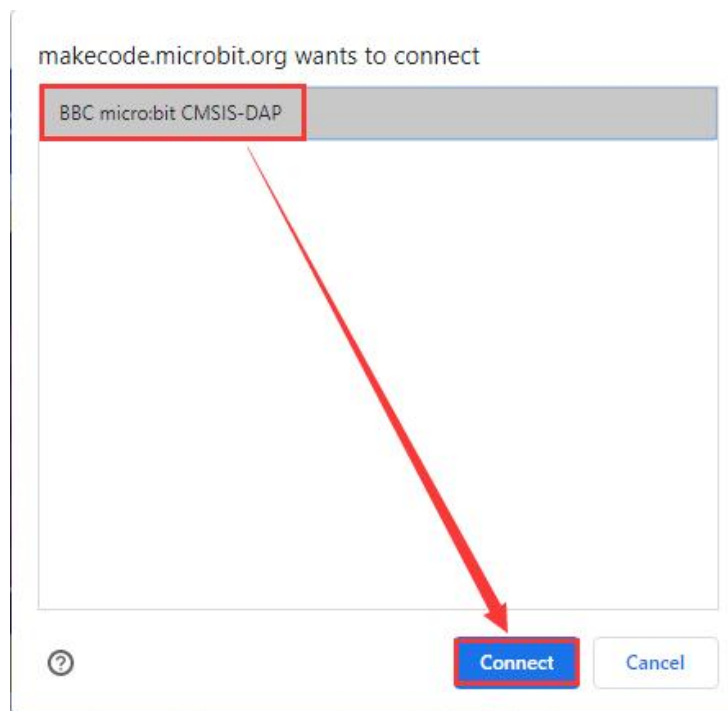Use the microUSB port on the top of the micro:bit

2 **Pair your micro:bit**
Click 'Pair device' below and select BBC micro:bit CMSIS-DAP or DAPLink CMSIS-DAP from the list
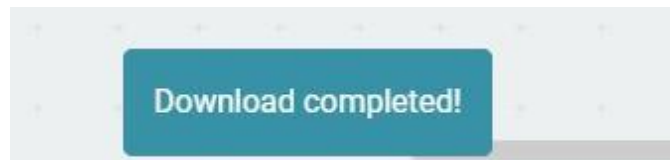
? **Pair device** ⟜

4) Click "Connect" as shown in image below.

5) Once connection is successful,click "Download". During downloading process, the yellow light on micro:bit will blink consistently, do not disconnect or change USB cable.

6) When download is finished, the light on micro:bit will remain on and screen will appear Download completed message.

Tips: In micro:bit drive there are two files as show in image above. DETAILS.TXT records the data information of the micro:bit board. MICROBIT.HTM links to micro:bit official web page (computer need to be online when click).

5. Results

Tips: Ensure sufficient lighting in the surrounding and use white background for better recognition results.

After program is downloaded, connect micro:bit to Expansion board and switch power to ON. WonderCam will automatically start on Image Classification function. Place the card in front of WonderCan, micro:bit will display corresponding item classification alphabet.

Refuse item classification:

H - Harmful; D - Dry rubbish; R - Recycle; W - Wet rubbish