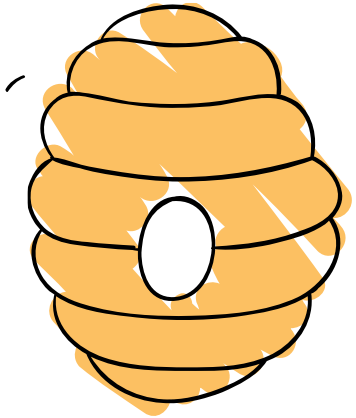
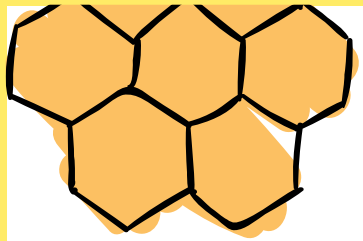


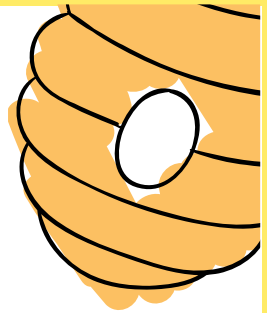
物聯網實務
期末專題展示

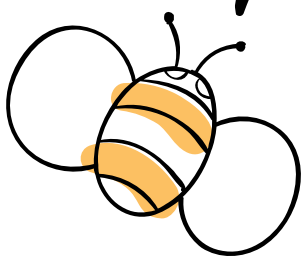
保全系統

組員：

ACS104109	陳曉萱
ACS104150	岳　彣







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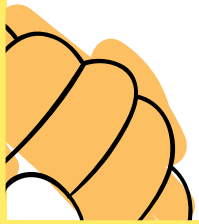
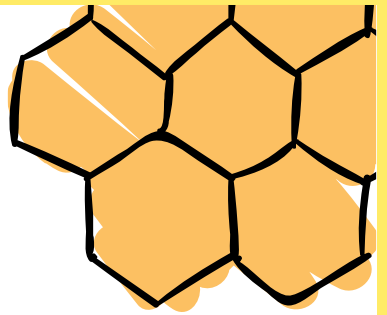
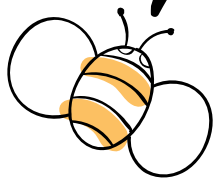
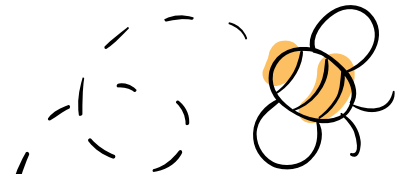






01

硬體說明



硬體說明

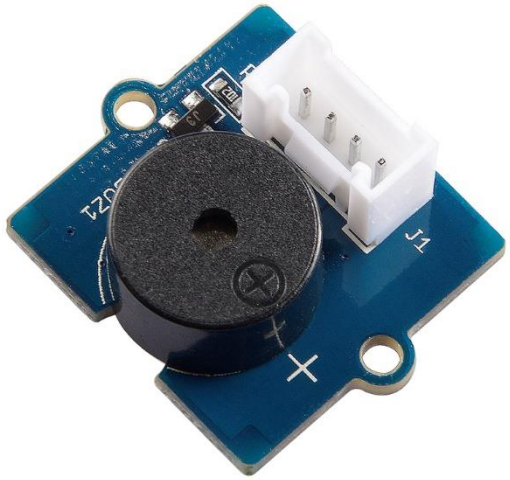
PIR Motion Sensor

紅外線人體移動採測感測器

當有人走入它的採測範圍時，PIR就會在它的SIG腳上輸出一個HIGH信號。

圖片來源：https://www.seeedstudio.com

硬體說明



Grove-Buzzer

在SIG 輸入 “HIGH” 會叫

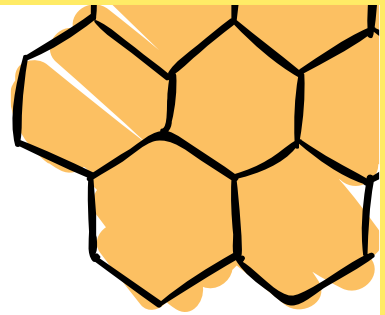
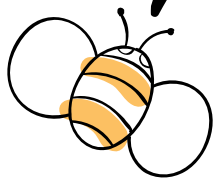
圖片來源：https://www.seeedstudio.com

硬體說明

LV-Maxsonar-EZ

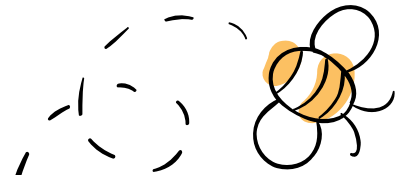
當有人走入它的探測範圍時，LV-Maxsonar-EZ就會在它的AN腳上輸出一個analog訊號。

圖片來源：https://www.seeedstudio.com

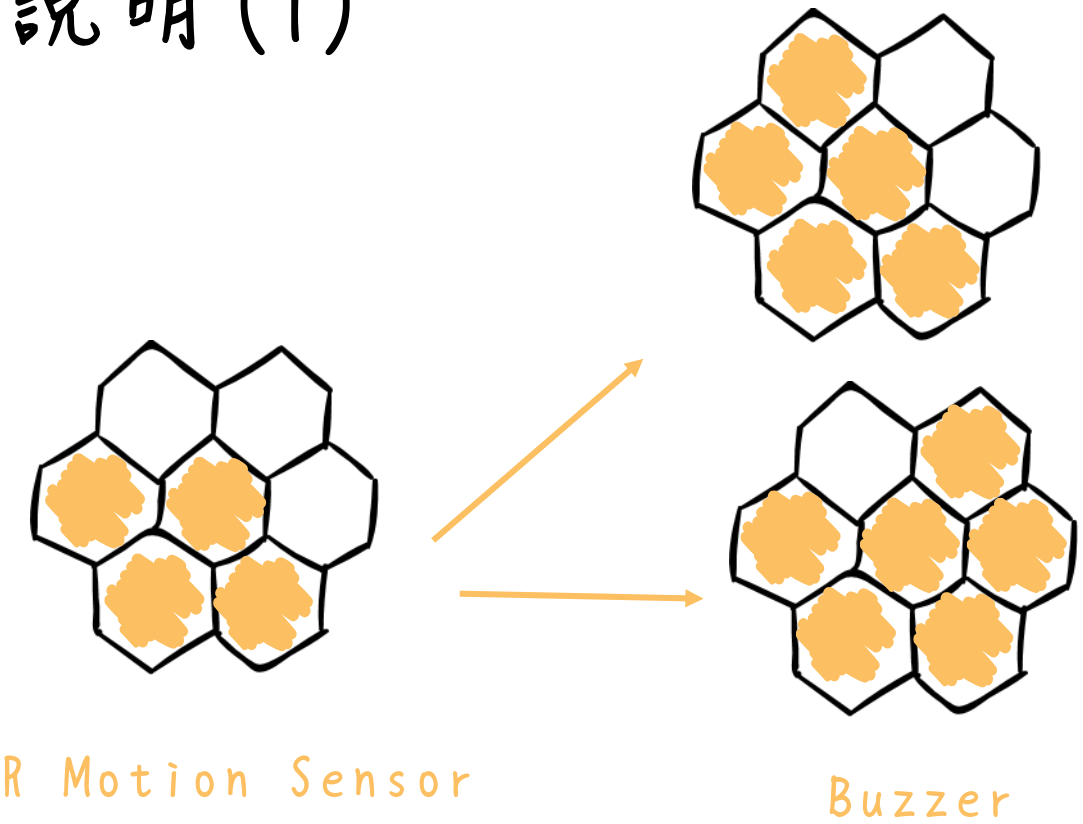




02

程式碼說明

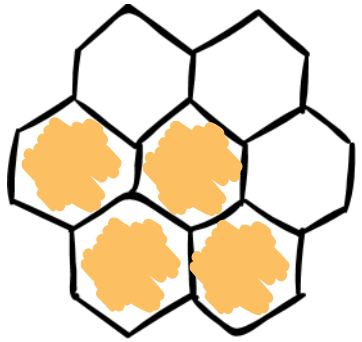



程式碼說明(1)



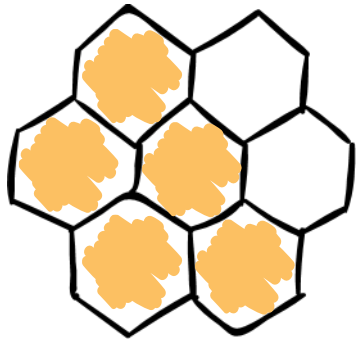
感測器感測到附近有活動物體時啟動蜂鳴器，同時傳送訊號至ThingSpeak 平台。

程式碼說明(2)

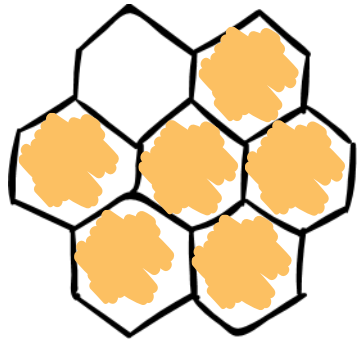


LV-Maxsonar-EZ

Motion Sensor



MQTT



Buzzer

感測器感測到附近有活動物體時透過MQTT傳至蜂鳴器。

- 設定傳送至ThingSpeak的參數

```python
from __future__ import print_function
#!/usr/bin/env python

import time
import mraa
import Adafruit_BBIO.GPIO as GPIO
from __future__ import print_function
import paho.mqtt.publish as publish


channelID = "648766"
apiKey = "Q6BYTE7UI3NH902K"
useUnsecuredTCP = False
useUnsecuredWebsockets = False
useSSLWebsockets = True
mqttHost = "mqtt.thingspeak.com"
if useUnsecuredTCP:
    tTransport = "tcp"
    tPort = 1883
    tTLS = None

if useUnsecuredWebsockets:
    tTransport = "websockets"
    tPort = 80
    tTLS = None

if useSSLWebsockets:
    import ssl
    tTransport = "websockets"
    tTLS = {'ca_certs':"/etc/ssl/certs/ca-certificates.crt",'tls_version':ssl.PROTOCOL_TLSv1}
    tPort = 443

# Create the topic string
topic = "channels/" + channelID + "/publish/" + apiKey
# build the payload string
tPayload = "field1=" + str(1)
```

- 設定pin、GPIO方向
- 讀取PIR sensor 的值
- 若是有感測到附近有東西就讓蜂鳴器響，同時傳資料到ThingSpeak上

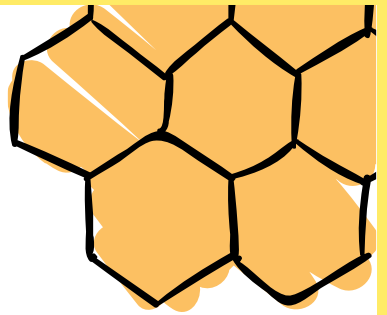
```
37
38  Buzzer = 68             # GPIO P9_22
39  PIR = 67                # GPIO P9_21
40
41  pir = mraa.Gpio(PIR)
42  buzzer = mraa.Gpio(Buzzer)
43
44  pir.dir(mraa.DIR_IN)
45  buzzer.dir(mraa.DIR_OUT)
46  GPIO.setup("P9_22", GPIO.OUT)
47  motion=0
48
49  while True:
50      try:
51          # Sense motion, usually human, within the target range
52          motion=pir.read()
53          if motion==0 or motion==1:  # check if reads were 0 or 1 it can be 255 also because of IO E
54              if motion==1:
55                  print ('Attention there is intruder.')
56                  publish.single(topic, payload=tPayload, hostname=mqttHost, port=tPort, tls=tTLS, tr
57                  GPIO.output("P9_22", GPIO.HIGH)
58                  time.sleep(2)
59              else:
60                  print ('-')
61
62              # if your hold time is less than this, you might not see as many detections
63          time.sleep(.2)
64
65
66      except KeyboardInterrupt:
67
68              GPIO.output("P9_22", GPIO.LOW)
69
70              print 'Program stop'
71
72              break
73
74      except IOError:
75          print ("Error")
```

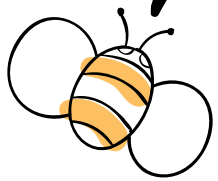
MQTT-SUBSCRIBER.py

```
import paho.mqtt.client as mqtt
import Adafruit_BBIO.GPIO as GPIO

def on_connect(client, userdata, flags, rc):
    print("Connected with result code "+str(rc))
    client.subscribe("BBGW")

def on_message(client, userdata, msg):
    print(msg.topic+" "+str(msg.payload))
    a=int(msg.payload)
    if a<400:
       GPIO.output(pin,GPIO.HIGH)
    else:
       GPIO.output(pin,GPIO.LOW)

pin="P9_14"
GPIO.setup(pin,GPIO.OUT)

client = mqtt.Client()
client.on_connect = on_connect
client.on_message = on_message
client.connect("169.254.114.42", 1883,10)
client.loop_forever()
```

MQTT-PUBLISHER.py

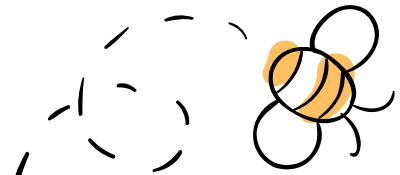
```
import paho.mqtt.client as mqtt
import Adafruit_BBIO.ADC as ADC


_g_cst_ToMQTTTopicServerIP = "61.223.94.80"
_g_cst_ToMQTTTopicServerPort = 1883 #port
_g_cst_MQTTTopicName = "BBGW" #TOPIC name

ADC.setup()
pin="P9_14"

while True:

    a=ADC.read_raw("P9_39")
    mqttc = mqtt.Client("python_pub")
    mqttc.connect(_g_cst_ToMQTTTopicServerIP, _g_cst_ToMQTTTopicServerPort)
    mqttc.publish(_g_cst_MQTTTopicName, str(a))
```



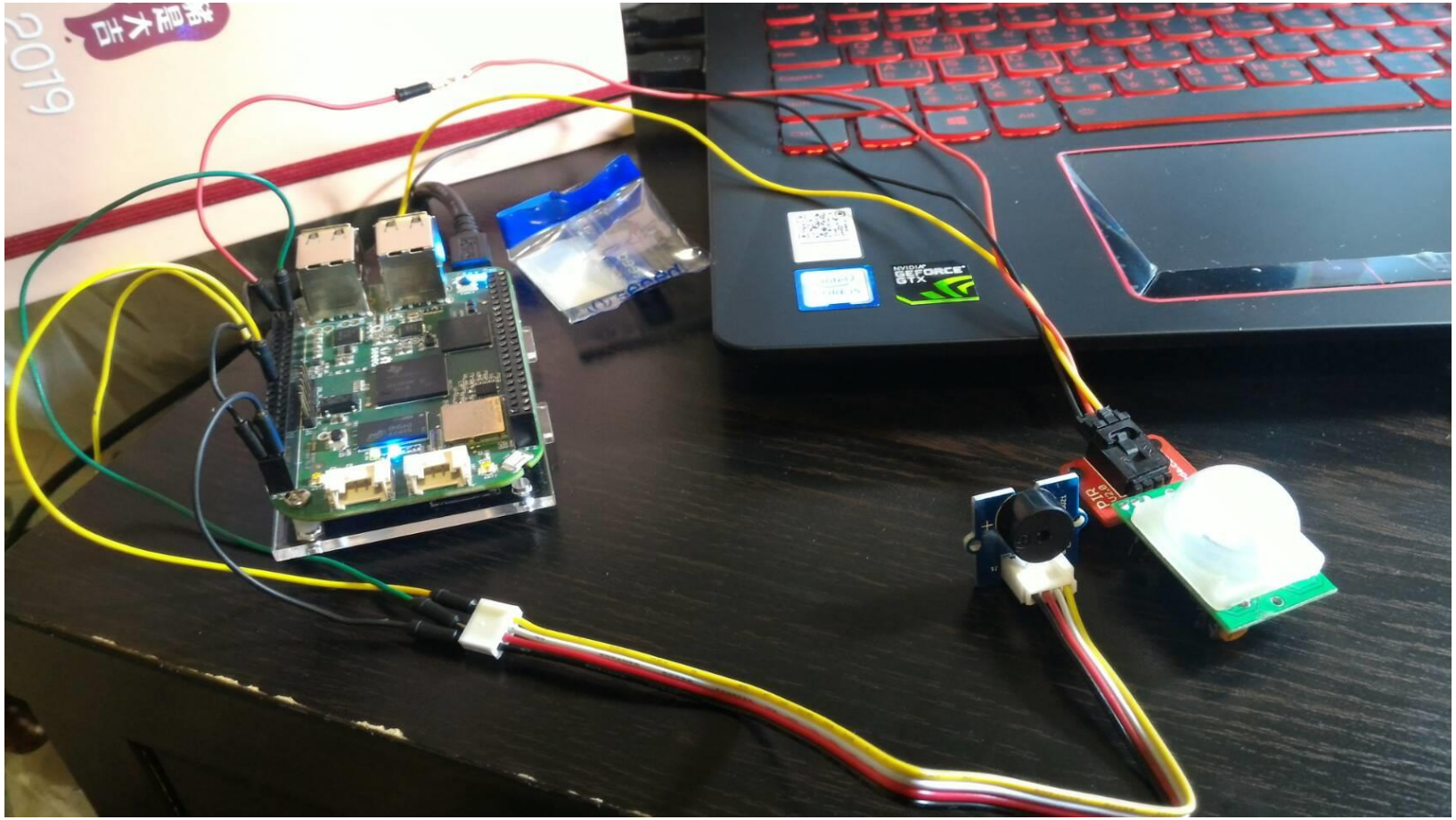


03

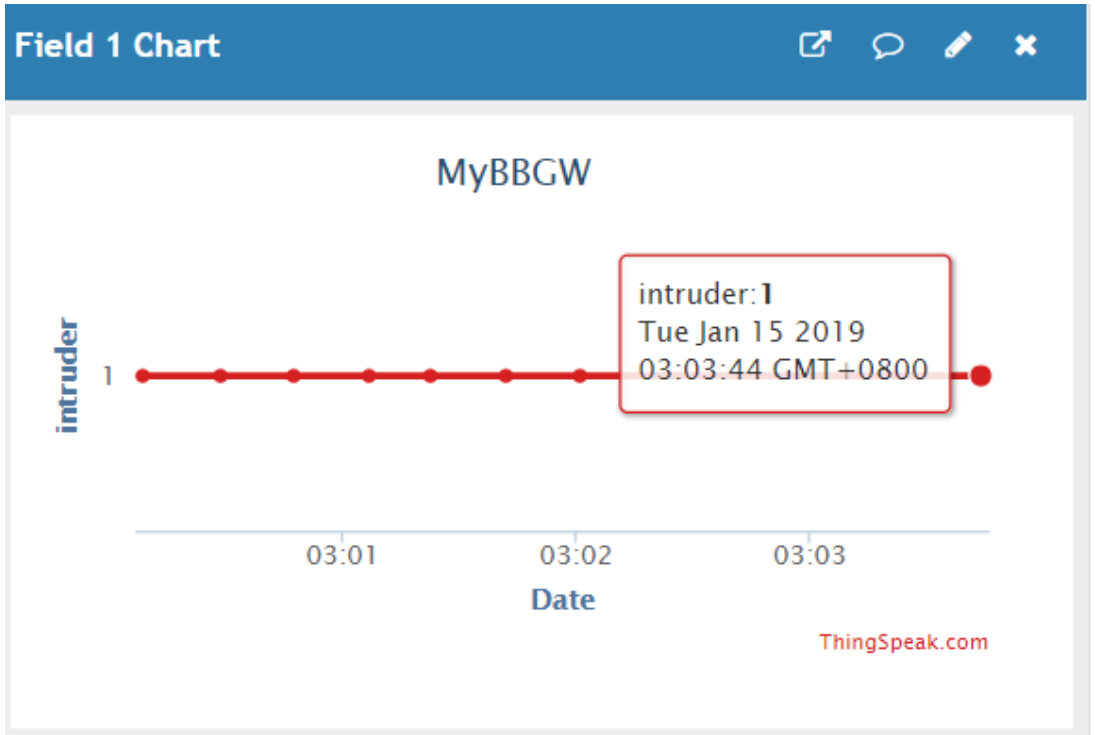
實際展示



實際電路畫面

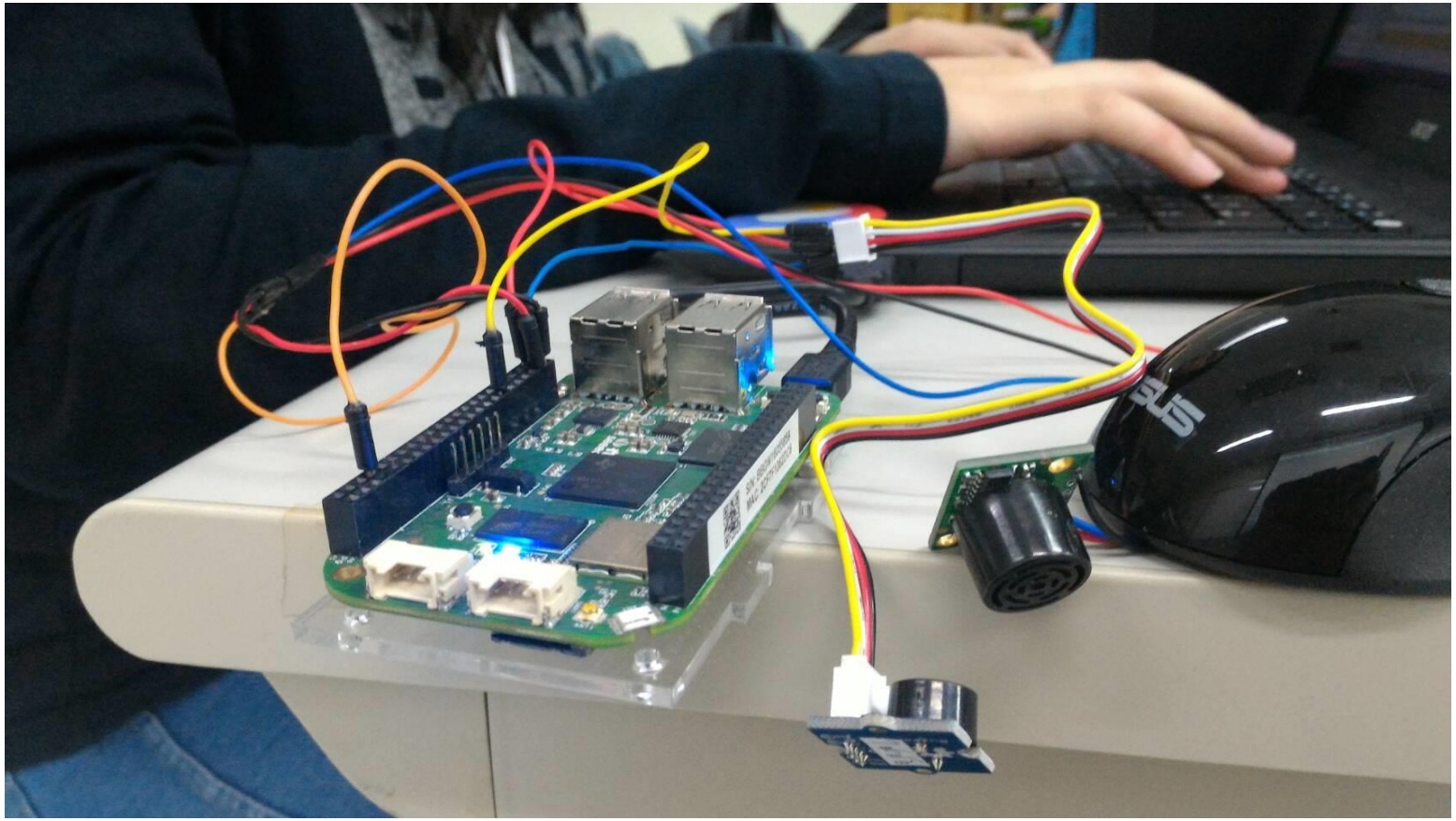


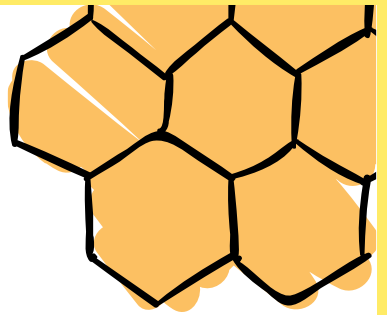
```
root@beaglebone:~/mraa# python PIR.py
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
_
_
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
Attention there is intruder.
```

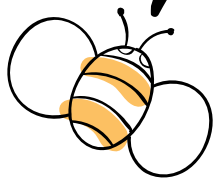


- ↑上圖為ThingSpeak 接收資料畫面：有入侵者入侵的時間跟日期
- ← 左圖為 BBGW 上執行畫面

實際電路畫面

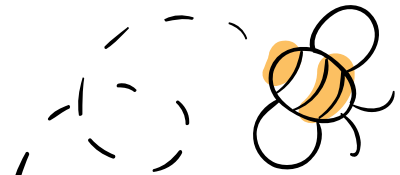






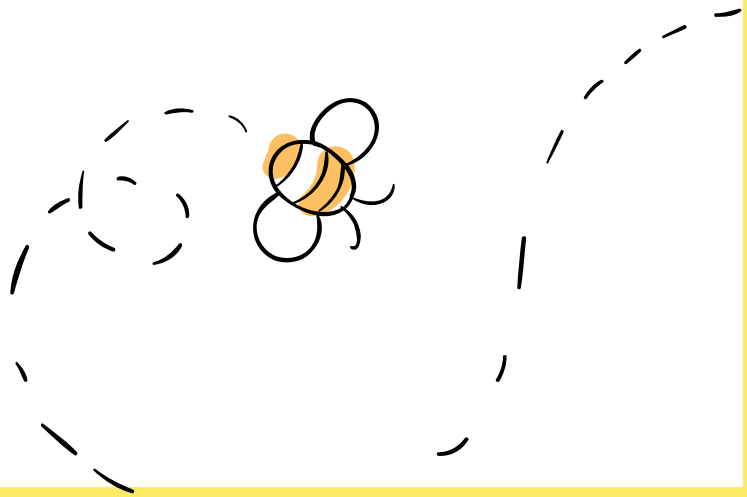
04

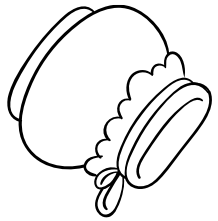
遇到的問題

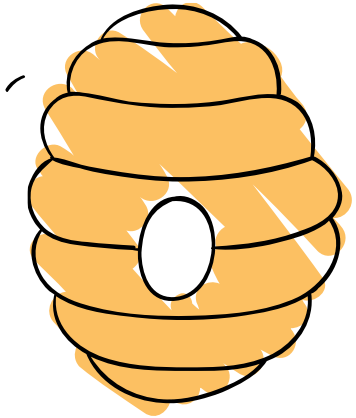


遇到的問題

- 忘記把防火牆關掉。
- 偵測範圍太廣，蜂鳴器叫不完。







報告到此結束