

# 物聯網(IoT)簡介

## 與

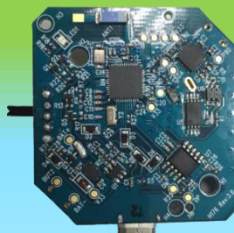
# IoTtalk 平台初體驗



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2022/09/17



# Agenda (綱要)

- What is IoTtalk ?
- Why using IoTtalk?
- IoTtalk with **AI / Machine Learning**
- **智慧科技栽種的薑黃 (影片 5分鐘) 、 IoTtalk 系統平台各種應用**
- Demo using iottalk ; **遙控器開關燈、手機隔空丟球, ...**
- 物聯網裝置程式(DA) 實作入門



# What is IoTtalk ? (1/2)

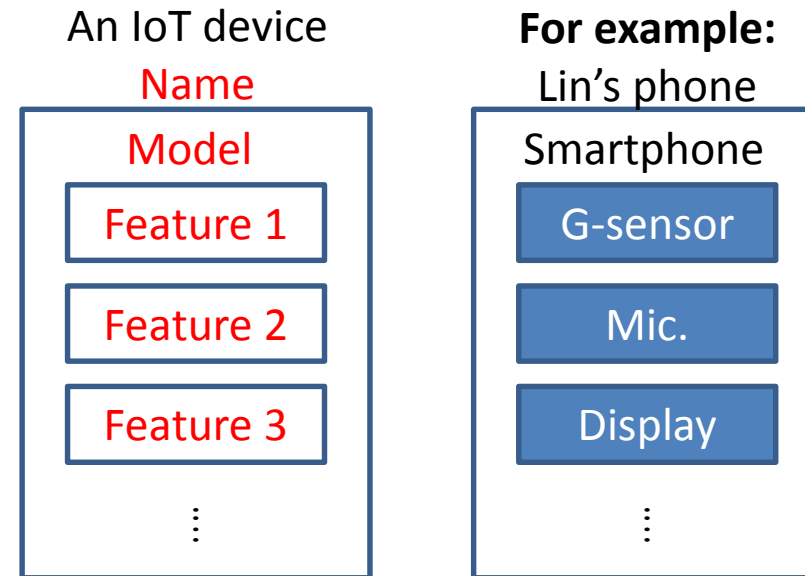
- IoTtalk: A Platform for IoT Applications Quick Development
- A Website



林一平教授研發團隊  
National Chiao Tung University

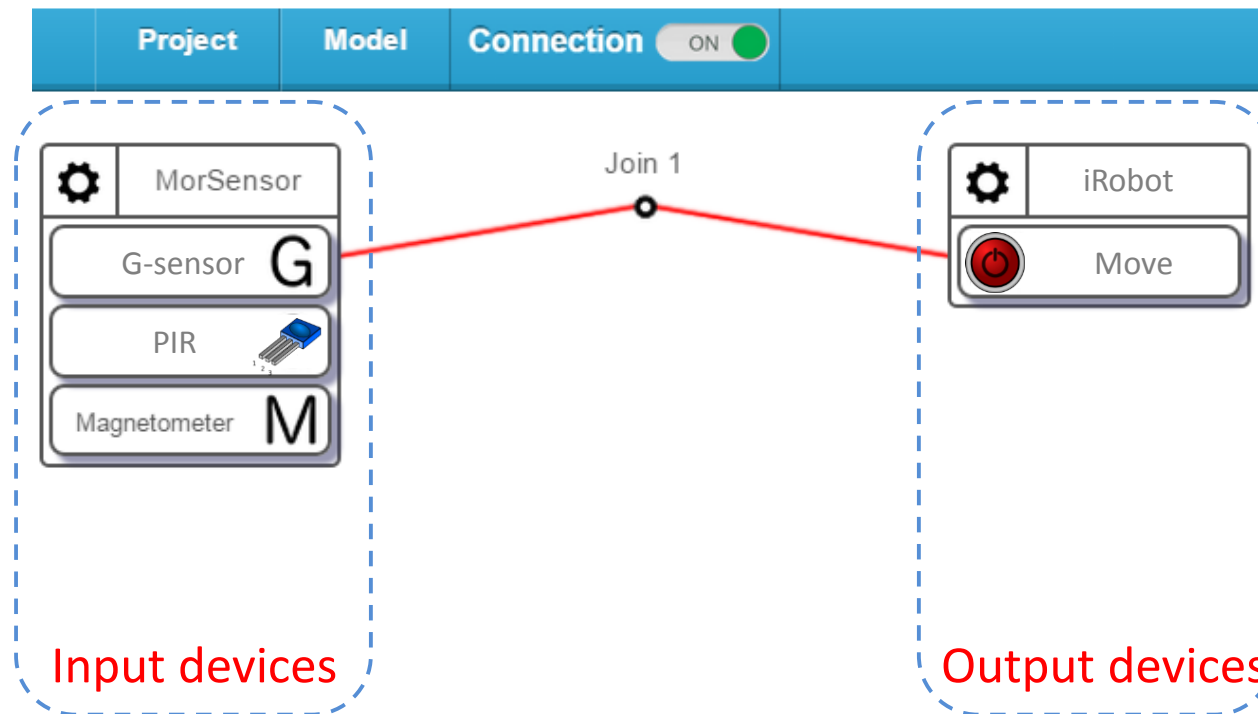
# What is IoTtalk? (2/2)

- **IoTtalk** is an IoT device management tool
- **IoT management concept**
  - **Device Feature (設備功能)**
    - The function or capability which an IoT can provide
  - **Device Model (設備模型、類別)**
    - A set of device features
    - A device model refers to a specific product
  - **Device name**
    - The name of a specific product



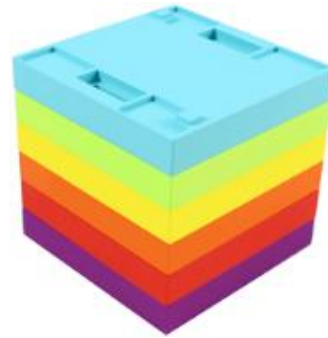
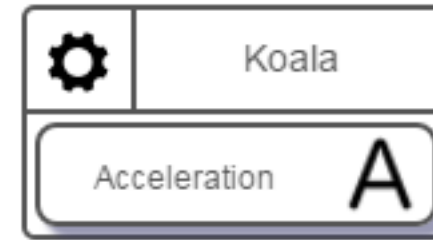
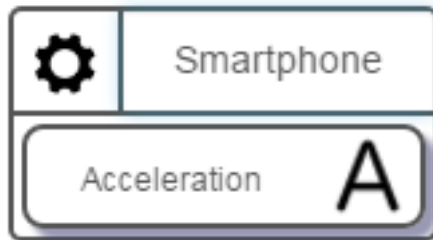
# Why using IoTtalk?

- Applications can simply develop **with lower efforts**
- **Simple** and **intuitive GUI**
- Application development **without real devices is feasible**



# Applications can simply develop **with** **lower efforts**

- Reusable DF modules
  - Even they are different IoT devices



# Application development **without real devices is feasible**

- Do not need the real devices first to develop applications
- The **simulator** provides the numerical values as inputs

IoTalk

140.113.199.200:7788/connection/21#

Project21 Model Connection ON Delete Simulation ON

Koala Acceleration A

Join 1

Dandelion Color-O C

IDF Monitor

Sub-stage: input

Timestamp	X1	X2	X3
04:10:11	0.56	0.30	0.16
04:10:12	0.69	0.78	0.79
04:10:13	0.14	0.81	0.61
04:10:15	0.30	0.79	1.00

Input Data  Send

ODF Monitor

Sub-stage: Function

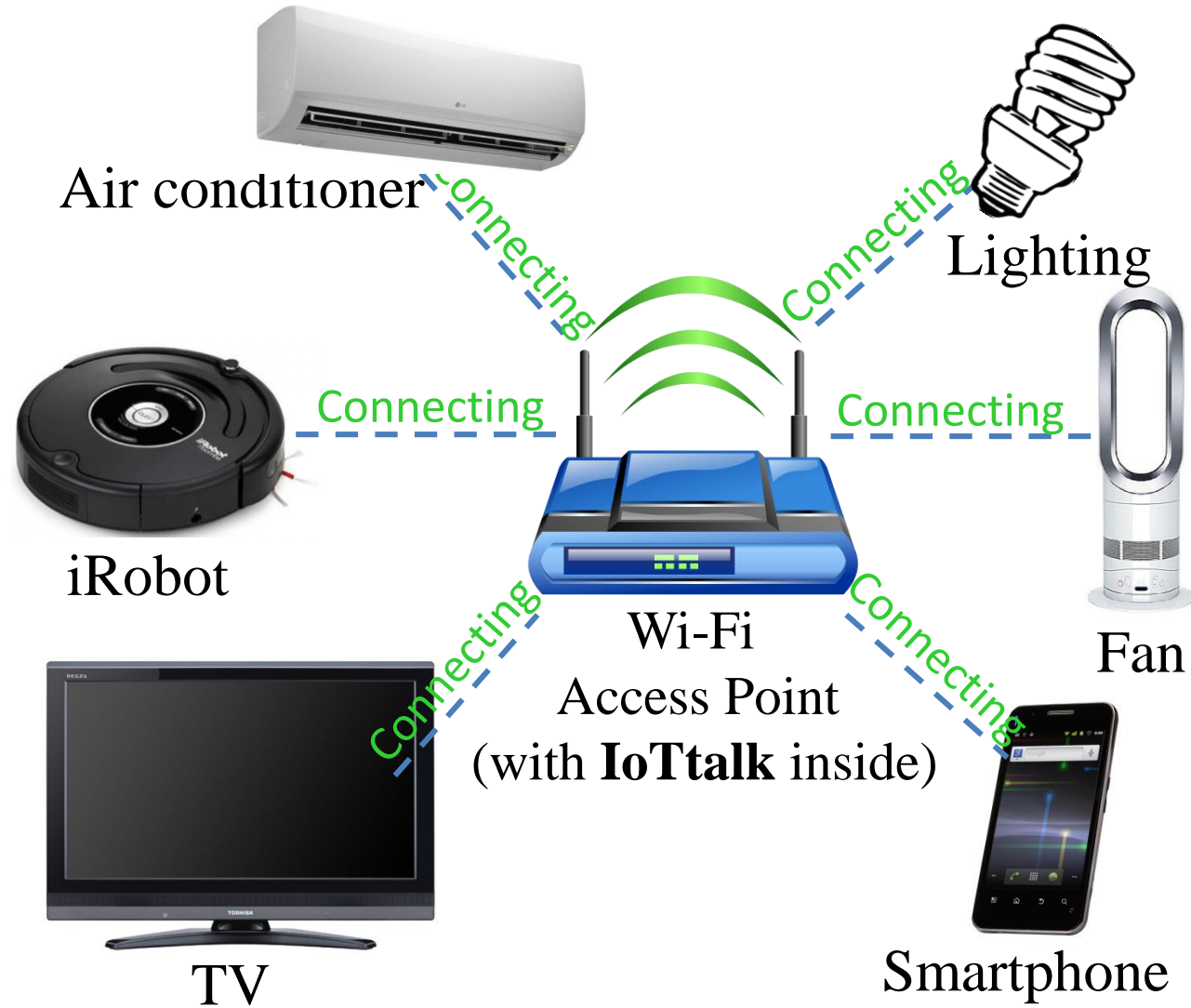
Timestamp	Y1,F	Y2,F	Y3,F
04:10:11	0.56	0.30	0.16
04:10:12	0.69	0.78	0.79
04:10:13	0.14	0.81	0.61
04:10:15	0.30	0.79	1.00

若還沒綁定(bind)輸入設備  
可先用模擬功能  
自動產生隨機輸入資料



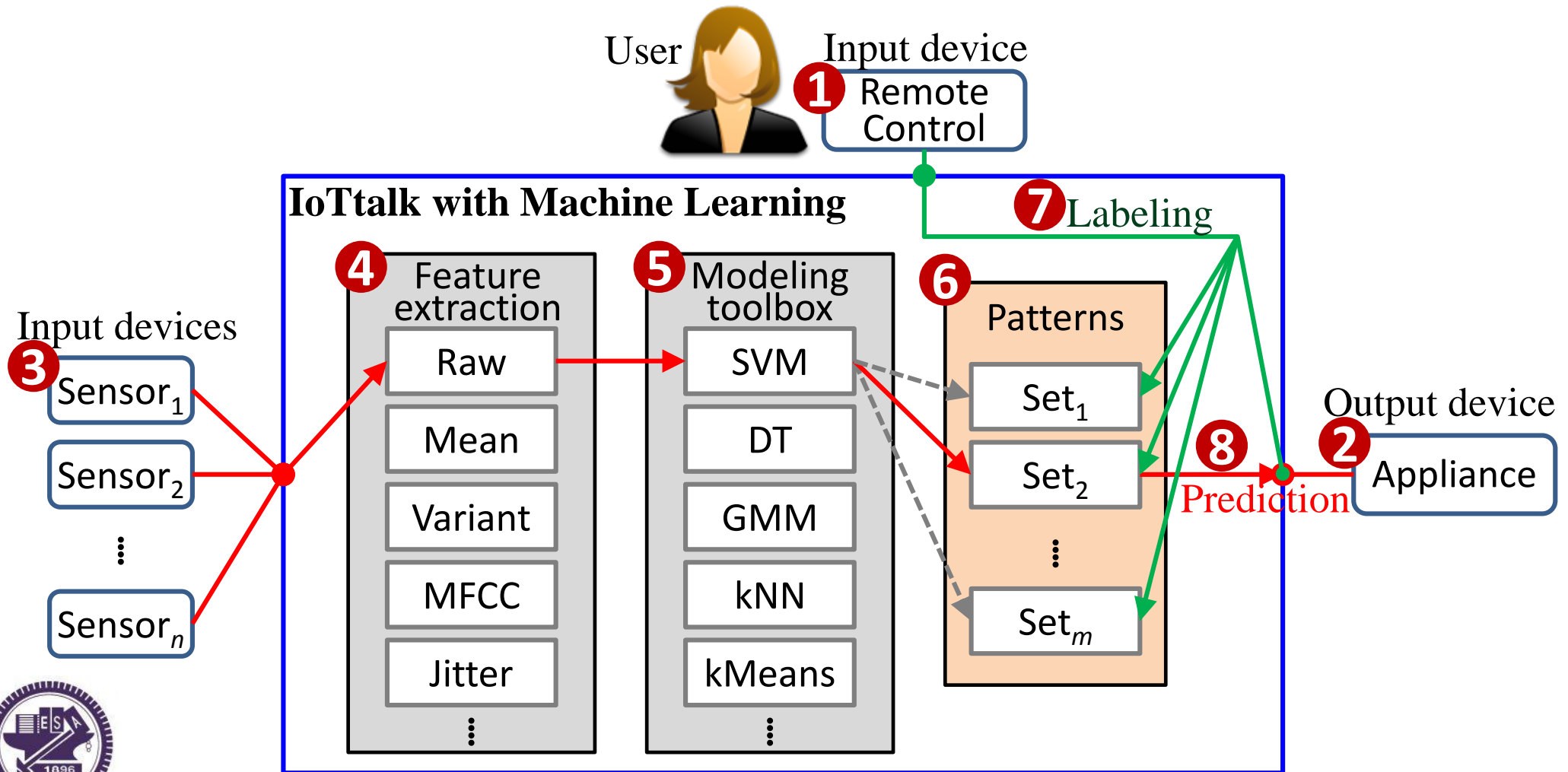


# Easy to Deploy and Operate Appliances/IoT Devices Connection





# IoTtalk with AI / Machine Learning



$$AIoT = AI + IoT$$

- **AI**
  - Artificial Intelligence 人工智慧 (人工智能)
- **IoT**
  - Internet of Things 物聯網
- **IoTtalk**
  - 物聯網應用程式產生平台 **by** 交大林一平教授團隊



# Before DEMO using IoTtalk platform

- <https://iottalk.vip/000/>





# 農譯 AgriTalk 其它影片

<https://www.agritalk.com.tw/關於我們/#video>

The screenshot shows the AgriTalk website interface. At the top, there is a navigation bar with the AgriTalk logo and menu items: 首頁, 關於我們, 最新消息, 智慧農業系統, 薑黃產品, 保健知識, and 聯絡我們. Below the navigation bar, the main heading reads "農譯 AgriTalk 影片". The page displays four video thumbnails:

- Top Left:** A video titled "【凱莉想當一日農夫 慘遭洗臉?】降...". The thumbnail shows a woman in a blue school uniform and a man. Text on the thumbnail includes "一日農夫" and "六十大教授傳智慧".
- Top Right:** A video titled "2020-03-25《POP搶先爆》朱學恒專來 實 陳文亮". The thumbnail shows two men in a studio setting. Text includes "POP Fm91.7" and "AgriTalk 科技 種出高品質薑黃".
- Bottom Left:** A video titled "無毒種田 博士研發生物抑制劑取代農...". The thumbnail shows a man in a white lab coat. Text includes "研發生物抑制劑" and "他不會傻傻一直吃這個".
- Bottom Right:** A video titled "【善用數據，精準種田】2030年，台...". The thumbnail shows a hand holding a smartphone displaying agricultural data. Text includes "善用數據，精準種田" and "台灣能否變身 智慧農業出口國?".



# IoTtalk 系統平台各種應用

- 農譯 AgriTalk : <https://www.agritalk.com.tw>
- 不是只有農譯 AgriTalk , IoTtalk已經很多商業化應用
- 林一平教授講解 IoTtalk 物聯網商業化應用經驗
  - [https://www.youtube.com/playlist?list=PL\\_IoHgkffY8o9oHhCICQdtSQVKE9vEcPV](https://www.youtube.com/playlist?list=PL_IoHgkffY8o9oHhCICQdtSQVKE9vEcPV)  
(共五個影片)



# Demo using iottalk

## Turn On/Off a Bulb (1/3)

- Create an IoT Application ..
  - For using a **Remote\_control** to control a **Bulb**
  - Device Models used
    - Bulb -- use ODF : **Luminance (亮度)**
    - Remote\_control – use IDFs:
      - **1 Knob (旋鈕) + 1 Switch (開關)**
  - Create a new project or use old project
  - **Import/Config a Bulb and a Remote\_control**
  - Connect from IDF to ODF (see Next page)

請用這練習: <https://demo.iottalk.tw>

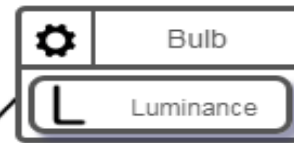
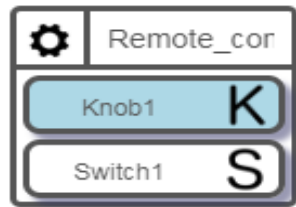


# Demo using iottalk

## Turn On/Off a Bulb (2/3)

✓ IDF on LEFT side

✓ ODF on RIGHT side

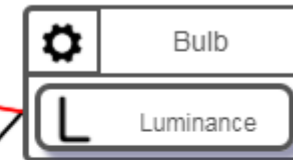
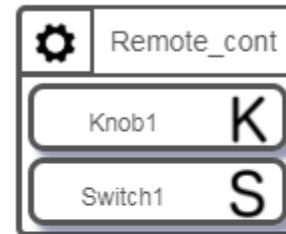


- Connect from IDF to ODF

Join 5

## 遙控燈泡的 Project

如果一個 Device  
同時有 IDF 和 ODF,  
在畫面上..  
會拆成左右兩個圖!



Join 1

Join 5

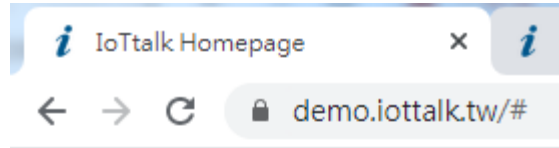
請用這練習: <https://demo.iottalk.tw>





# Demo using iottalk

## Turn On/Off a Bulb (3/3)



### IoTtalk:

- [Project](#)
- [Device Feature Management](#)
- [Device Monitor](#)
- [Project Management](#)

### Cyber Device List:

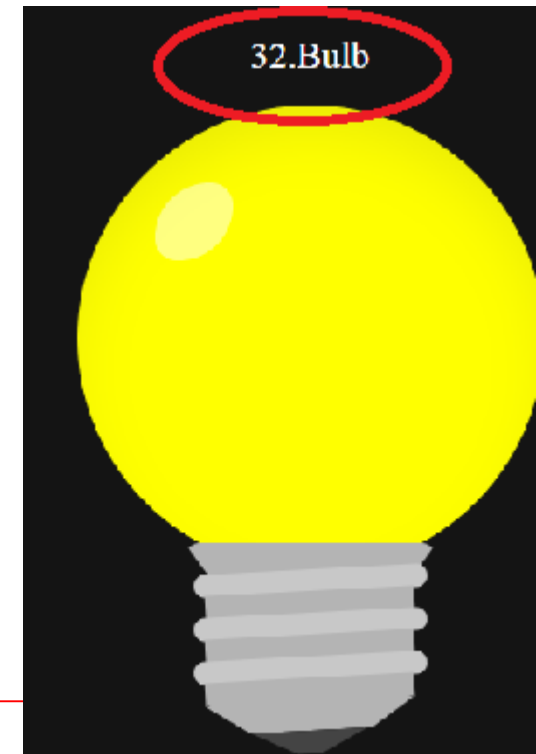
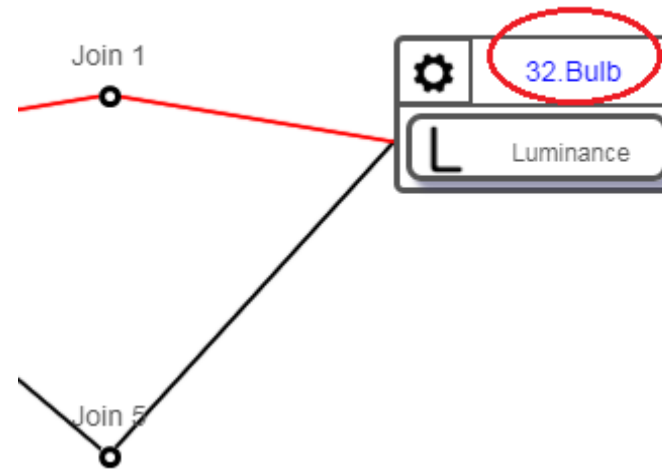
- [Bulb](#)
- [CHT\\_Dashboard](#)
- [Dandelion\\_control\(mobile\)](#)
- [GPS](#)
- [Graph](#)
- [Map](#)
- [Message](#)
- [RC\\_static](#)
- [RandNum](#)
- [Remote control](#)
- [Remote\\_control\(mobile\)](#)
- [SensorSystem](#)
- [Smartphone](#)
- [Smartphone\(static\)](#)
- [Voice Control](#)

➤ Request DA: (on the IoTtalk HOME page)

✓ a Remote\_control + a Bulb

➤ Bind(綁定或稱關聯) your Devices

➤ Test your project 😊



請用這練習: <https://demo.iottalk.tw>



# Demo using iottalk (Step by Step)

請用這練習: <https://demo.iottalk.tw>

Step 0 Press **Project** Link (生出新網頁) then Select a project

← → ↻ demo.iottalk.tw/#

## IoTtalk:

- [Project](#)
- [Device Feature Management](#)
- [Device Monitor](#)
- [Project Management](#)

## Cyber Device List:

- [Bulb](#)
- [GPS](#)
- [Message](#)
- [RandNum](#)
- [Remote control](#)
- [Remote control\(mobile\)](#)
- [Smartphone](#)

## VPython List:

- [3DMotion1](#)
- [3DMotion2](#)
- [AirResistance1](#)
- [AirResistance2](#)



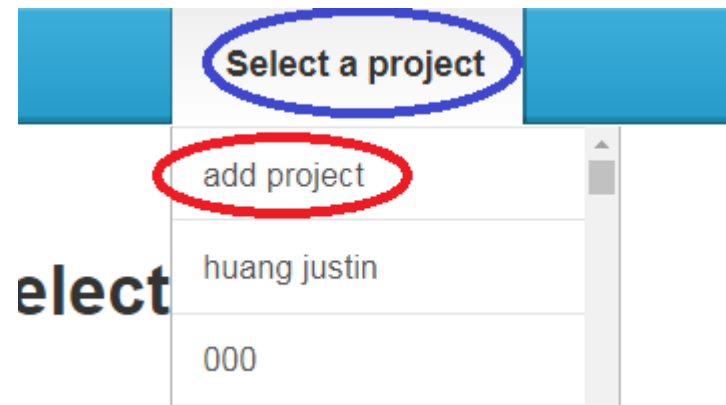
# Demo using iottalk (Step by Step)

Step 1 Press **Project** Link (生出新網頁) then Select a project

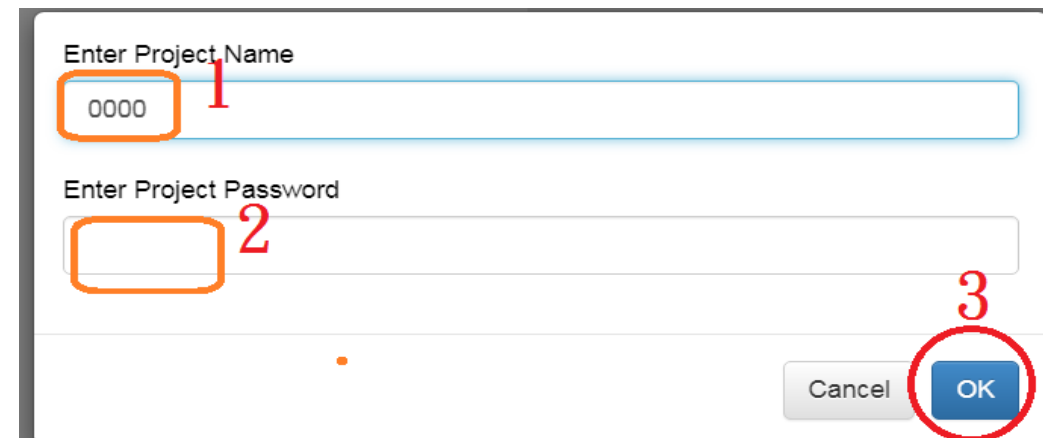


The screenshot shows a blue header bar with the text "Select a project". Below the header, the text "Please select a project." is displayed in a large, bold, black font.

Step 2 add a new project OR using your OLD project



The screenshot shows the "Select a project" dialog box with a dropdown menu open. The dropdown menu contains the following options: "add project", "huang justin", and "000". The "add project" option is circled in red. The word "elect" is partially visible on the left side of the dialog box.

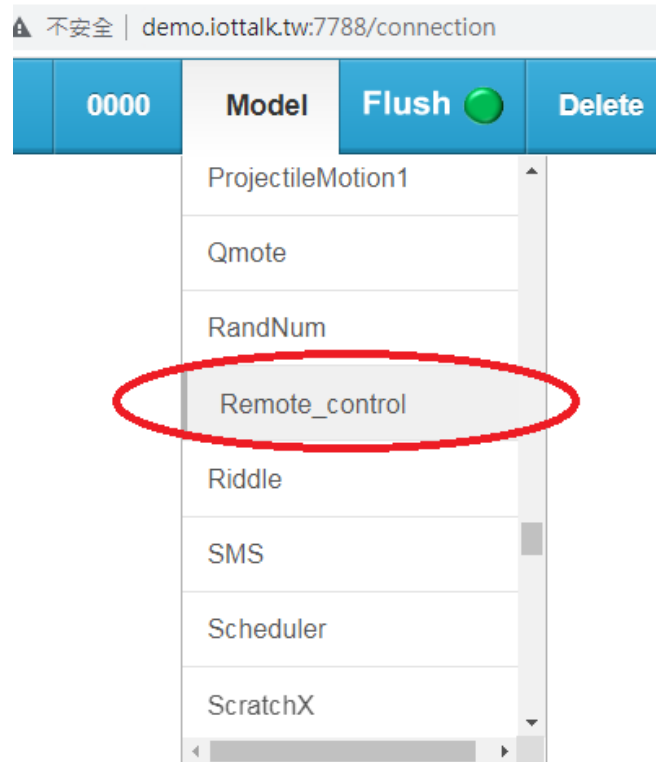


The screenshot shows a form with two input fields. The first field is labeled "Enter Project Name" and contains the text "0000". The second field is labeled "Enter Project Password" and is empty. The "Enter Project Name" field is circled in orange with a red "1" next to it. The "Enter Project Password" field is circled in orange with a red "2" next to it. At the bottom right of the form, there are two buttons: "Cancel" and "OK". The "OK" button is circled in red with a red "3" next to it.

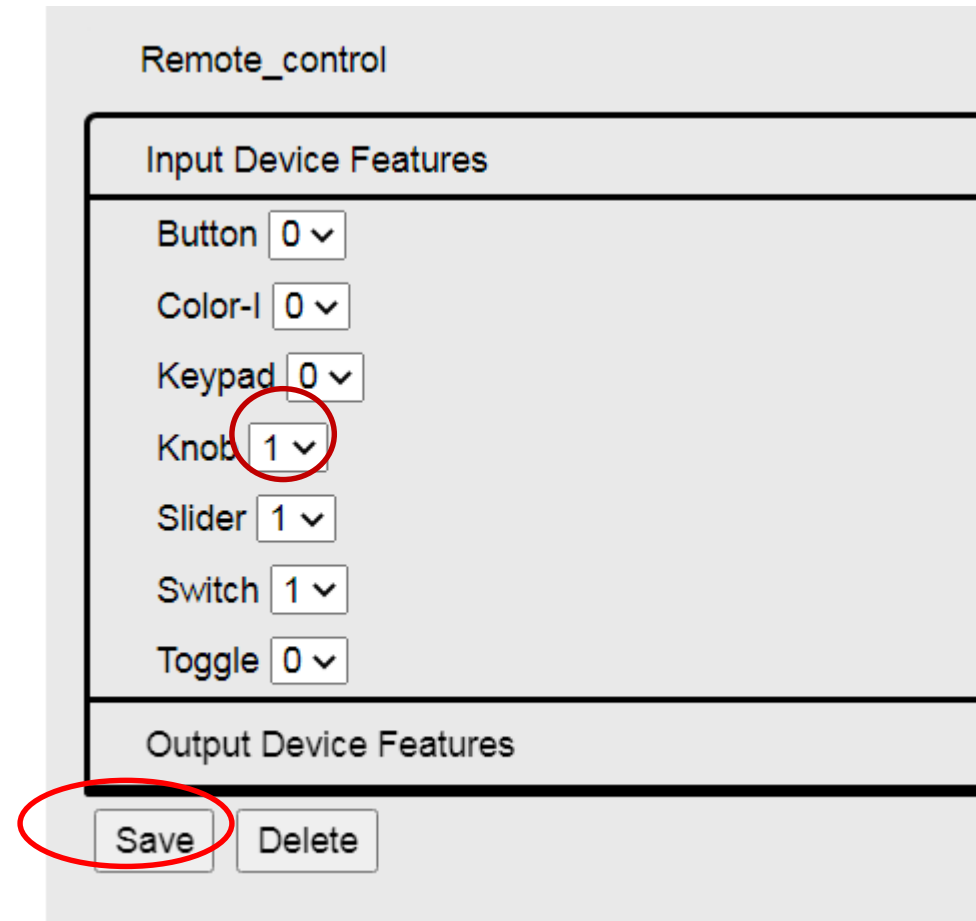
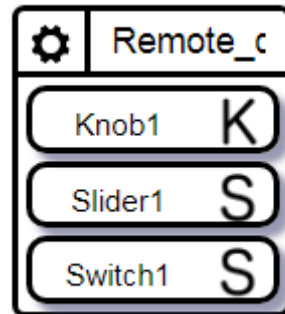


# Select an **Input** Device Model and Features

## Step 3. Select a Device Model



## Step 4. Select Device features, and an icon is appeared



# Select an **Output** Device Model and Features

Step 5. Similar to Steps 3 and 4

不安全 | demo.iottalk.tw:7788/connection

0000	Model	Flush	Delete
	Brain_Signal_Simulator		
	Btest		
	<b>Bulb</b>		
	CHT_AirCondition		
	CHT_AirPurifier		
	CHT_CO2TH		
	CHT_Dashboard		

Bulb

Input Device Features

Output Device Features

Color-O

Luminance

**Save**

Bulb

**L** Luminance



# Connect IDF to ODF (1/2)

Step 6. Draw a line to connect IDF and ODF

← → ↻ 不安全 | demo.iottalk.tw:7788/connection 🔑 🗨️ 🔍 📄 ☆ ⚙️ 🗑️ 👤 更新

0000 Model Flush ● Delete Simulation ● OFF Import Export

Join 1

Remote\_control (IDF)

Knob1	Type	Function
x1	sample	knob_to_color

Bulb (ODF)

Luminance	Function
v1	disabled

# Connect IDF to ODF (2/2)

Step 7. Select the IDF function to set the connection logic

Step 8. Select the ODF function to set the connection logic

**Step 9. Click joint point to check input TYPE and join function**

0000 Model Flush  Delete Simulation  OFF Import Export

Connection Name: Join 2

Remote_control (IDF) <input type="button" value="Delete"/>		
Knob1	Type	Function
x1	sample	knob_to_color

Bulb (ODF) <input type="button" value="Delete"/>	
Luminance	Function
y1	disabled



# Create Devices: Remote\_control and Bulb

← → ↻ demo.iottalk.tw/#

## IoTtalk:

- [Project](#)
- [Device Feature Management](#)
- [Device Monitor](#)
- [Project Management](#)

用電腦或手機連入與  
Project 同一個  
iottalk 網頁

## Cyber Device List:

- [Bulb](#)
- [GPS](#)
- [Message](#)
- [RandNum](#)
- [Remote control](#)
- [Remote control\(mobile\)](#)
- [Smartphone](#)

點這 Bulb 可生出虛擬燈泡(網頁)

點這可生出普通萬用遙控器

## VPython List:

- [3DMotion1](#)
- [3DMotion2](#)
- [AirResistance1](#)
- [AirResistance2](#)
- [Ball-Slid](#)
- [Ball-Slide1](#)
- [Ball-Slide2](#)
- [Ball-Spin](#)
- [Ball-throw1](#)
- [Ball-throw2](#)
- [Collision1](#)
- [Collision2](#)

注意要選有 (mobile) 的!

隔空丟球用 Ball\_throw2



# Bind your Input and Output Device

## Step 8. Bind your Input and Output Device

The screenshot shows a web browser window with the address bar displaying "demo.iottalk.tw:7788/connection". The interface includes a top navigation bar with buttons for "0000", "Model", "Flush" (with a green indicator), "Delete", "Simulation" (with a red "OFF" toggle), "Import", and "Export".

The main workspace displays a circuit diagram. On the left is a "Remote\_c" block containing "Knob1 K", "Slider1 S", and "Switch1 S". On the right is a "Bulb" block containing "Luminance". Two join nodes, "Join 1" and "Join 2", are positioned between the blocks. Red lines indicate connections from "Knob1" to "Join 1" and "Join 2", and from "Slider1" to "Join 1" and "Join 2". Black lines connect "Join 1" to the "Bulb" block and "Join 2" to the "Bulb" block. The "Remote\_c" block is circled in orange.

On the right side, a terminal window displays the following log entries:

```
00.Remote_control
01.Remote_control
00.Remote_control
00.Remote_control
01.Remote_control
```

# Test your IoTtalk Project

- 用電腦或手機上的遙控器控制另一手機或電腦上的燈泡
- 可以在 **Project** 網頁重新綁定另一個遙控器或另一個燈泡
- 從iottalk首頁點 **Bulb** 生出網頁且它的 **DA** 會連入 **IoTtalk server** 註冊
- 任何物聯網裝置的 **DA (Device Application)** 程式都要連入 **IoTtalk server** 註冊
  - 這樣你才可在 **Project** 網頁內點你的 **DM** 右上角四方型看到它們



# 詳細步驟與用法請參考

- [https://youtu.be/ptupVe\\_qnkY](https://youtu.be/ptupVe_qnkY) (用遙控器控制燈泡 12分鐘影片)
  - <https://iottalk.vip/000#THROW> (用手機隔空丟球)
  - 其它一些使用 IoTtalk 相關影片
    - <https://www.youtube.com/tsaiwn>
- ✓ 可在 [youtube.com](https://www.youtube.com) 內搜尋 [iottalk + tsaiwn](#)
- <https://iottalk.vip/000/> (IoTtalk使用手冊詳細網頁)



# Take a Break



# 物聯網裝置程式(DA) 實作入門

- [https://iottalk.vip/static/iottalk/01/0917/iottalk\\_0917\\_B.pdf](https://iottalk.vip/static/iottalk/01/0917/iottalk_0917_B.pdf)

\* \* [點這到\(四\)如何用Python寫Dummy Device + \(五\)進階Dummy Device + \(六\) More練習..](#)

\* \* [點這到後面看\(七\)新增可用設備模型\(管理Device Model\) ;](#)

\* \* [點這到\(八\)如何用 IoTtalk 連接真實設備... \(Arduotalk, ESP8266, Arduino Yún\) ;](#)

\* \* [點這到\(九\) 搭配 Raspberry Pi 3 B+ ;](#)

\* \*  [\(十\) 關於 Rabboni 小玩具](#) 以及  [Rabboni 搭配 IoTtalk](#)

\* \* [藝術家 and 賈伯斯 都說: 創意, 偷就有了! \(往下跳到第\(八\)項結束之後\)](#)

\* \* 補充關於 (八)如何用 IoTtalk 連接真實設備...

\* 關於 **Arduotalk-for-NodeMCU** 注意事項.. (用 Google 搜尋 github + iottalk+nodemcu)

==> 注意 **NodeMCU/ESP8266 V2** 開發板(搭載 **CP210x USB-to-TTL** 晶片)

比較窄小, 方便使用一個麵包板,



# 神秘遙控器

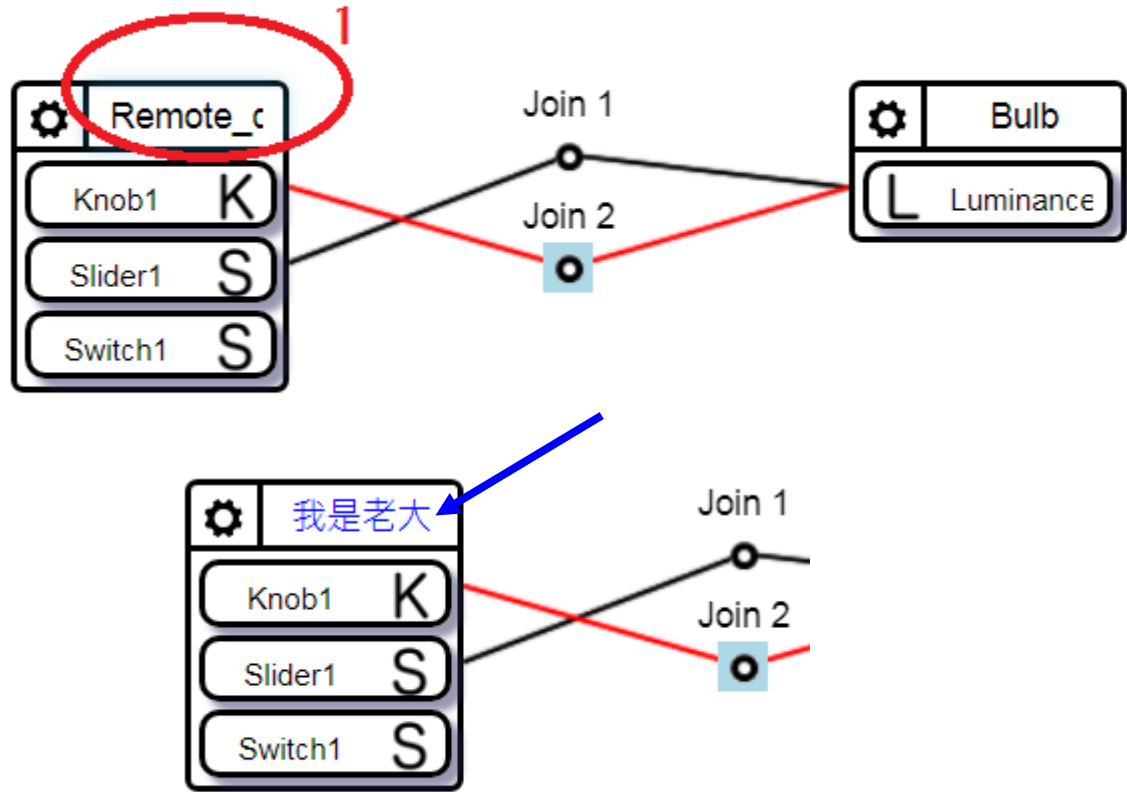
- **Server網址/RemoteControl/自取名稱**

← → ↻  demo.iottalk.tw/RemoteControl/我是老大

Remote control "我是老大" successfully registered.  
Please bind it in the IoTtalk GUI.







A vertical stack of five black panels with white text. The panels contain the following text from top to bottom: '00.Remote\_control', '00.Remote\_control', '00.Remote\_control', '01.Remote\_control', and '我是老大'. The bottom panel, containing '我是老大', is circled in red and labeled with a red '2'.

# 神秘遙控器



- Server網址/RemoteControl/自取名稱

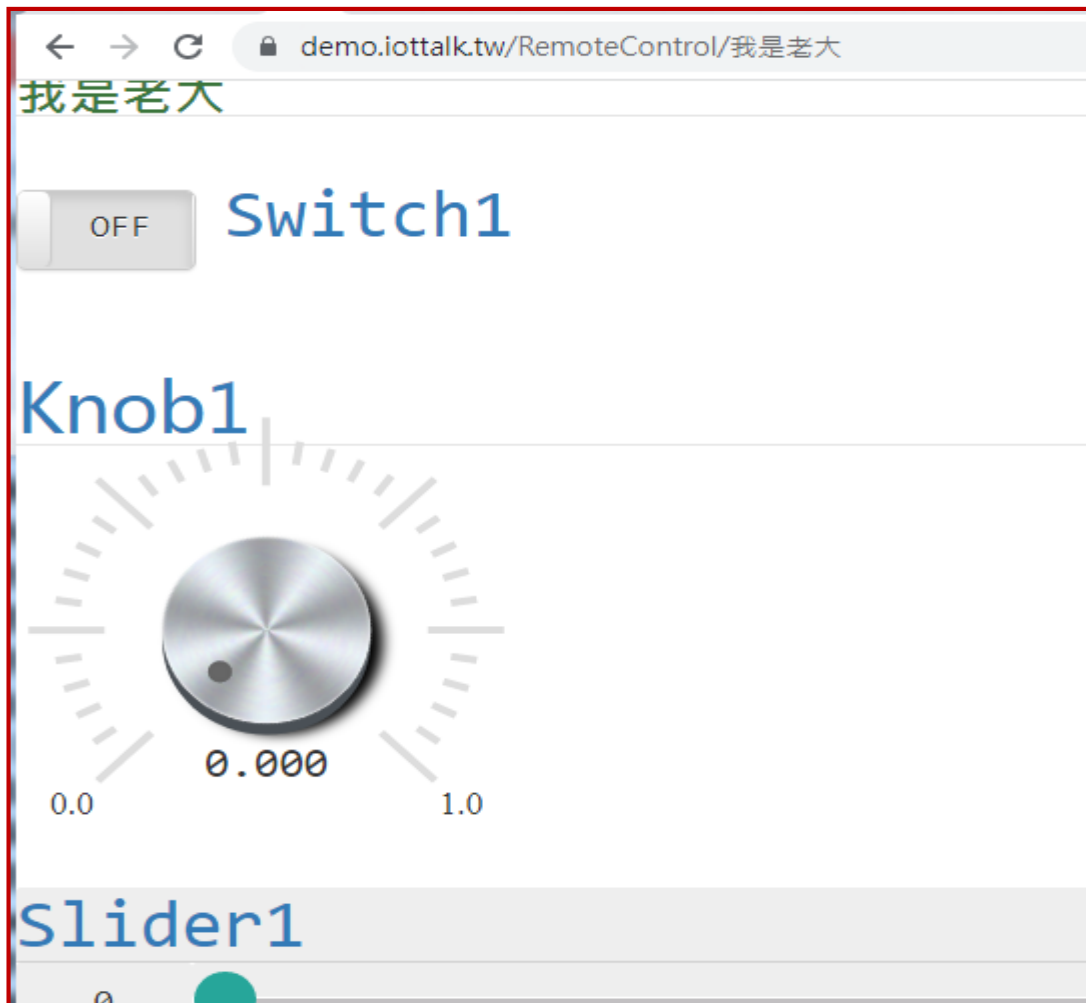
回到剛那頁



- 按 F5 刷新網頁



這可控制燈泡顏色  
(當然燈泡(Bulb)要  
勾選顏色功能)



神秘遙控器

# Demo using iottalk -- 用 Smartphone 隔空丟球 Ball-Throw2

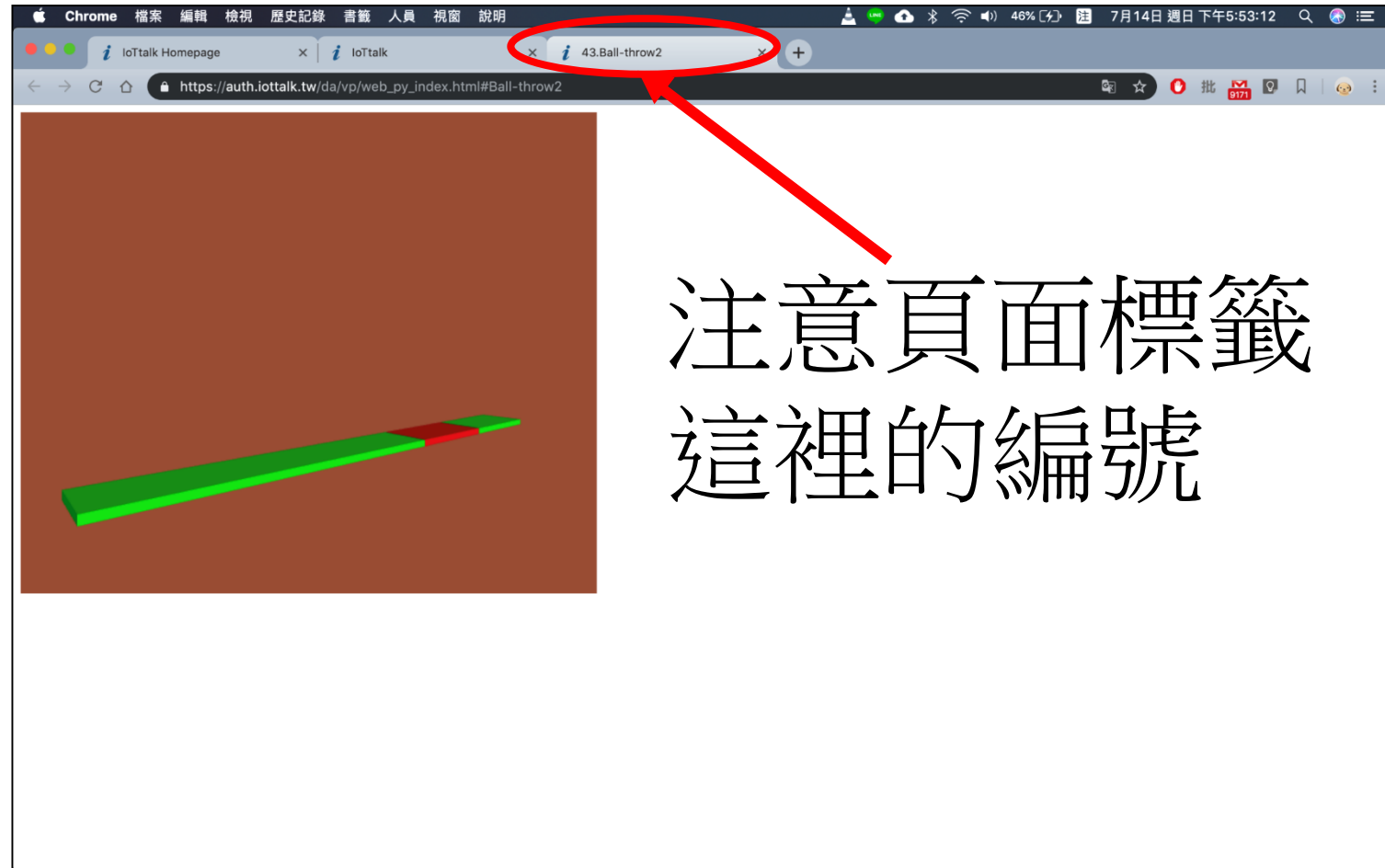
- Input Device Model 選 Smartphone
  - 功能只要勾選 Acceleration (重力加速度感測器)
- Output Device Model 選 Ball-Throw2



# 隔空丟球 Ball throw2 (1/2)

## VPython List:

- [3DMotion1](#)
- [3DMotion2](#)
- [AirResistance1](#)
- [AirResistance2](#)
- [Ball-Slid](#)
- [Ball-Slide1](#)
- [Ball-Slide2](#)
- [Ball-Spin](#)
- [Ball-throw1](#)
- [Ball-throw2](#)
- [Collision1](#)
- [Collision2](#)
- [Collision3](#)
- [Collision4](#)
- [ConicalPendulum1](#)
- [ConicalPendulum2](#)



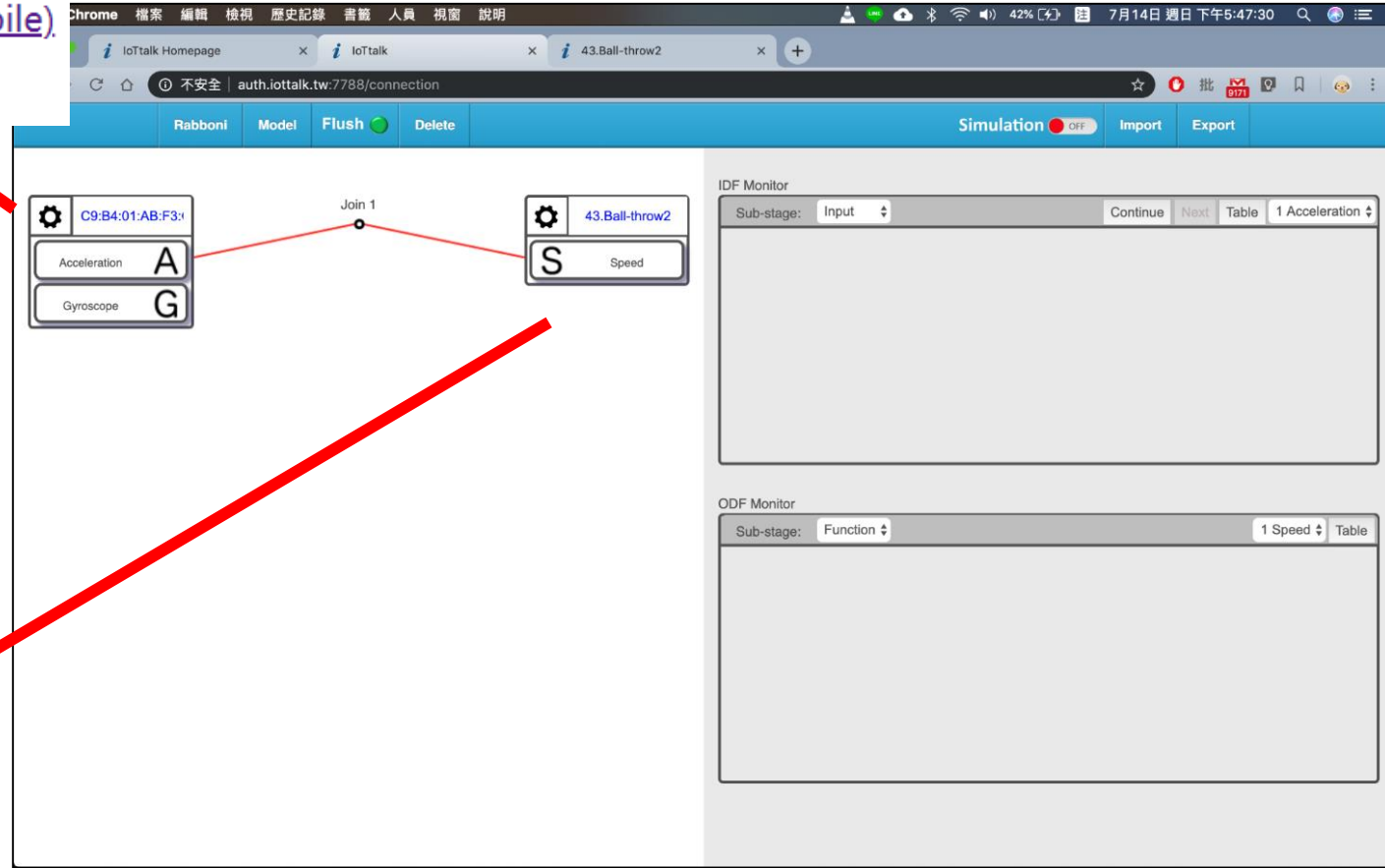
### Cyber Device List:

- [Bulb](#)
- [GPS](#)
- [Message](#)
- [RandNum](#)
- [Remote control](#)
- [Remote control\(mobile\)](#)
- [Smartphone](#)

# 隔空丟球 Ball throw2 (2/2)

### VPython List:

- [3DMotion1](#)
- [3DMotion2](#)
- [AirResistance1](#)
- [AirResistance2](#)
- [Ball-Slid](#)
- [Ball-Slide1](#)
- [Ball-Slide2](#)
- [Ball-Spin](#)
- [Ball-throw1](#)
- [Ball-throw2](#)
- [Collision1](#)
- [Collision2](#)
- [Collision3](#)
- [Collision4](#)
- [ConicalPendulum1](#)
- [ConicalPendulum2](#)



參考: <https://iottalk.vip/000/#THROW>

# Debug your IoTtalk project (1/2)

- Common ways **to solve** the problem(s)
  - Try **FLUSH** button first
  - Ensure **Simulation** Mode is OFF
  - Make sure you have correct Association/Binding
  - **Check** all parameters with the Joint (connection LINE) **Click Mouse LEFT**
    - Sample / **Variant**; Joint function(s) applied; RANGE of IDF/ODF value
  - **Monitor** Data Flow on the Joint: RAW value/Scale value: **RIGHT Click**
    - **If necessary, DELETE the Joint (LINE), then Reconnect it**
    - **Check all parameters again**
    - **Press FLUSH button**



# Debug your IoTtalk project (2/2)

- Some Common problems in IoTtalk project
  - Warning SIGN appears (出現!驚嘆號警告)
    - The Device bound to/associated with is GONE
    - You Applied WRONG Function(s)
    - Error(s) in your Python Function
  - Device Register Fail (向 IoTtalk 伺服器註冊失敗)
    - DELETE devices NOT used in [Device Monitor Page](#)
    - If you can modify the DA program,  
Use a specific Device Name (**d\_name**);  
Note that **NOT** DM\_NAME
    - If you RUN multiple copies, also Note the Registration Address



請用這練習: <https://demo.iottalk.tw>

# using iottalk

- <https://demo.iottalk.tw>
- <https://test.iottalk.tw> (備用)

謝謝捧場

*tsaiwn@cs.nctu.edu.tw*

蔡文能



<https://map.iottalk.tw/map>



# 重要參考網頁

✓ <https://iottalk.vip/000/> (iottalk 教學)

✓ <https://iottalk.vip/6> (Python 入門)

## ◆ HTML

✓ <https://tsaiwn.weebly.com> 網頁相關 > 簡單的教學

– GOOGLE 搜尋 HTML + w3school

## ◆ JavaScript

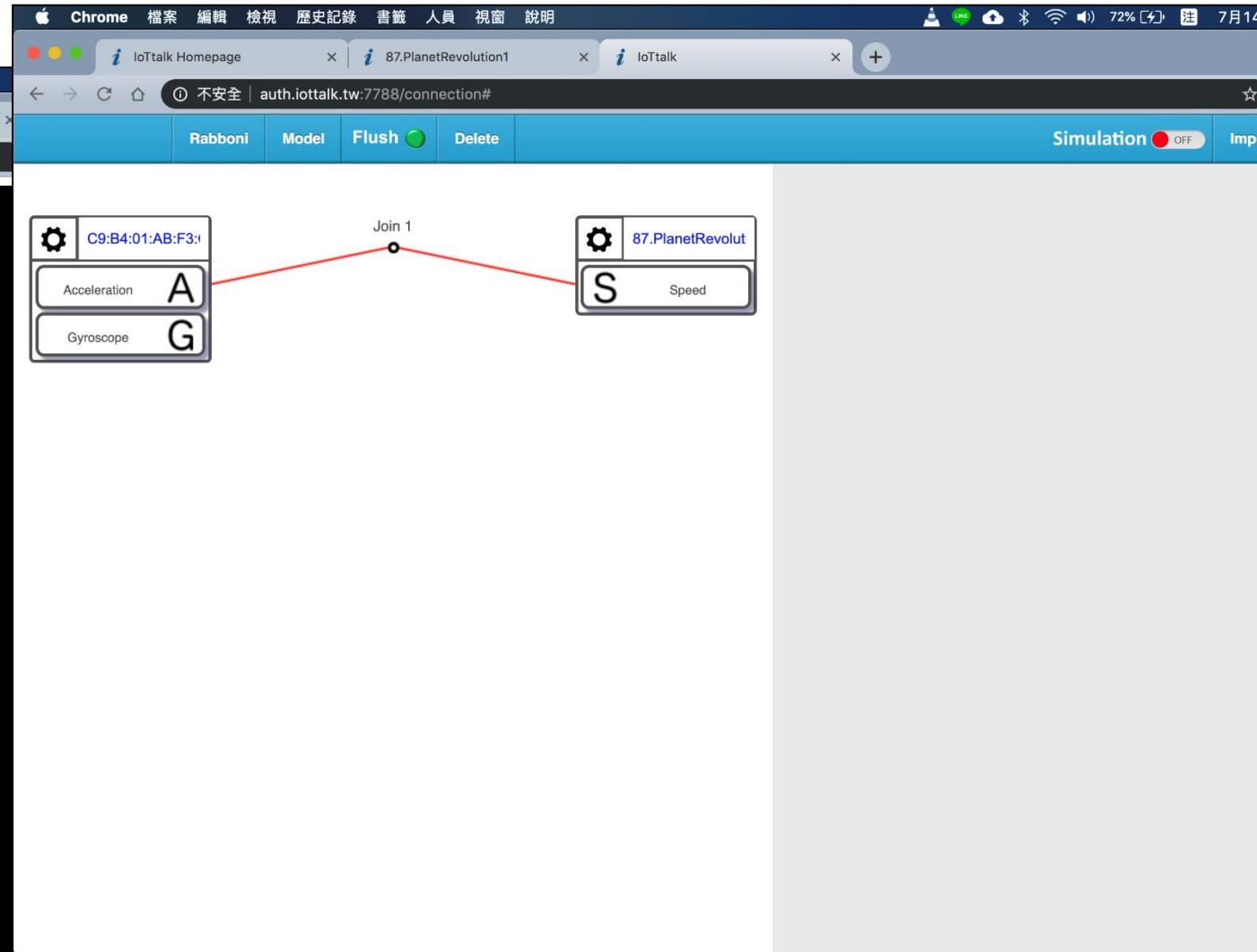
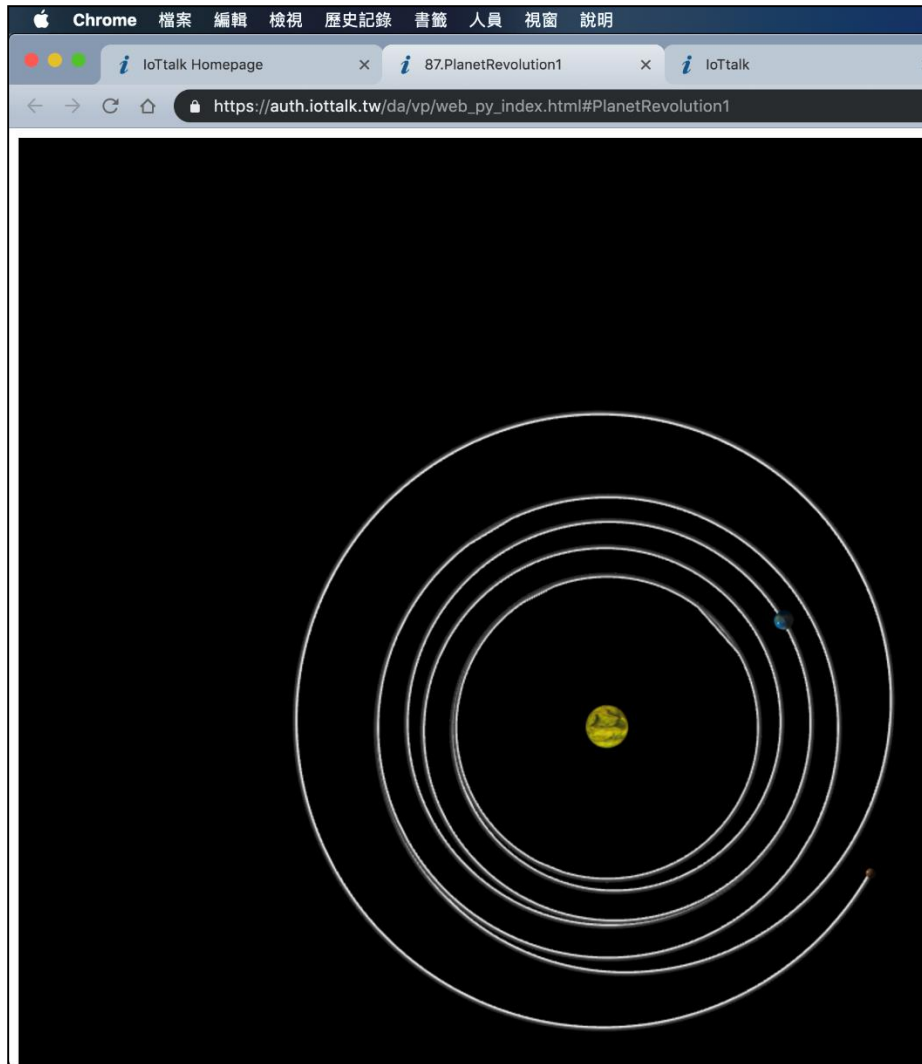
✓ <https://iottalk.vip/static/ab.html>

(檢視網頁原始碼，大略看 JavaScript 寫的幾 A 幾 B 遊戲)

– GOOGLE 搜尋 javascript + w3school



# 行星運動



# 地球公轉

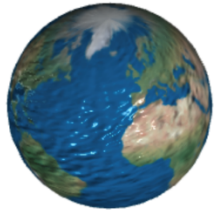
Chrome 檔案 編輯 檢視 歷史記錄 書籤 人員 視窗 說明

IoTalk Homepage x 42.Ball-Spin x IoTalk

https://auth.iottalk.tw/da/vp/web\_py\_index.html#Ball-Spin

Initial values:  
Friction:0.46  
Speed: 17

Speed:17

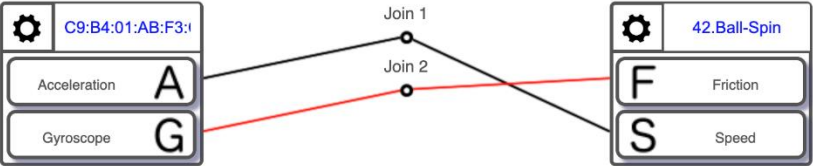


Chrome 檔案 編輯 檢視 歷史記錄 書籤 人員 視窗 說明

IoTalk Homepage x 42.Ball-Spin x IoTalk

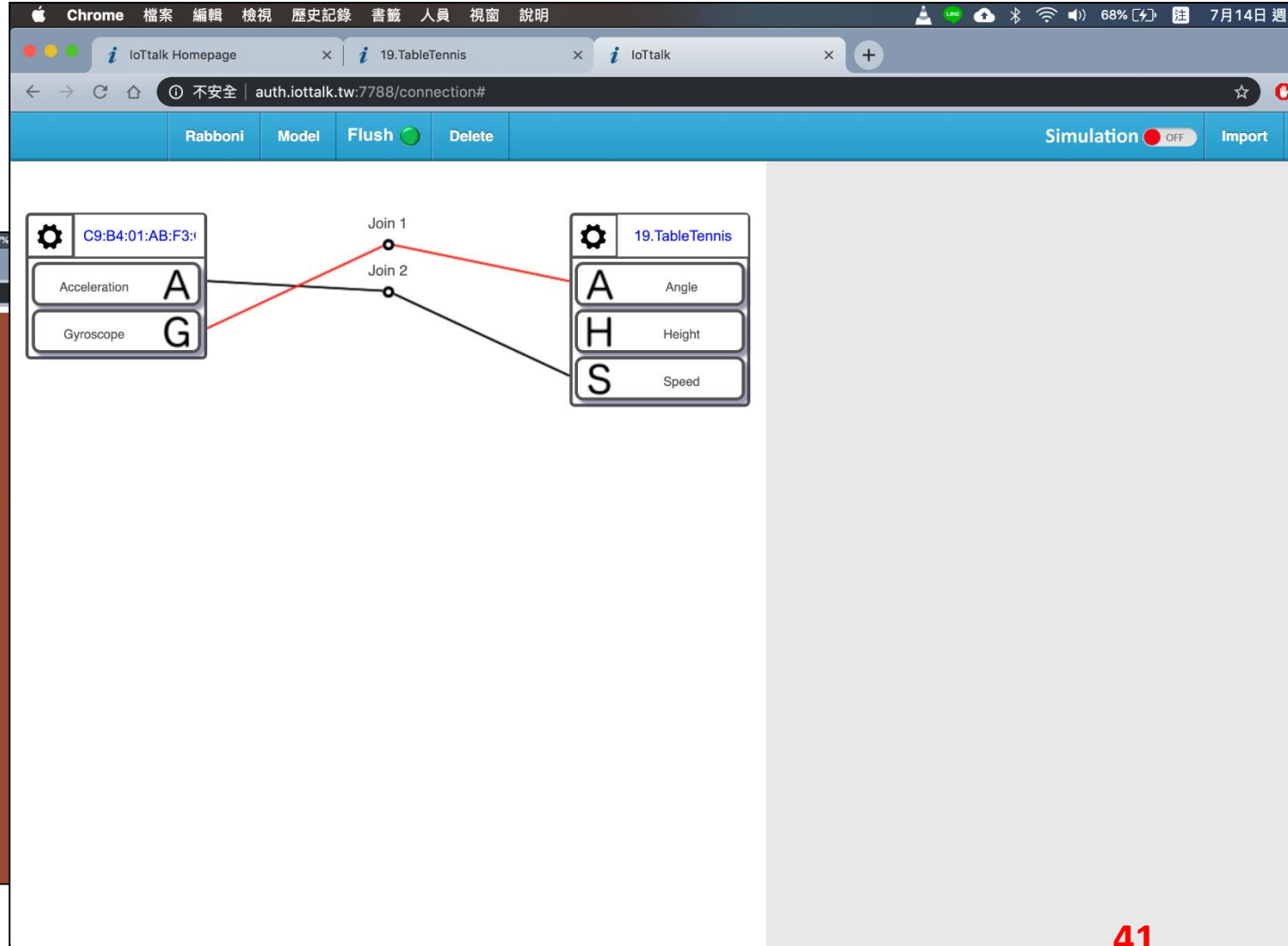
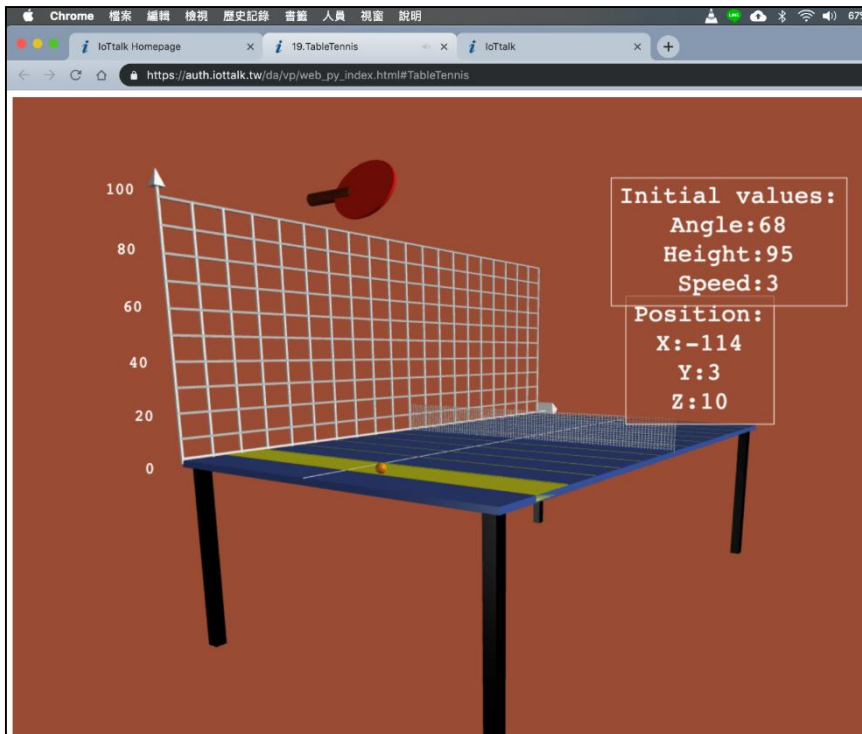
auth.iottalk.tw:7788/connection#

Rabboni Model Flush Delete Simulation OFF Import

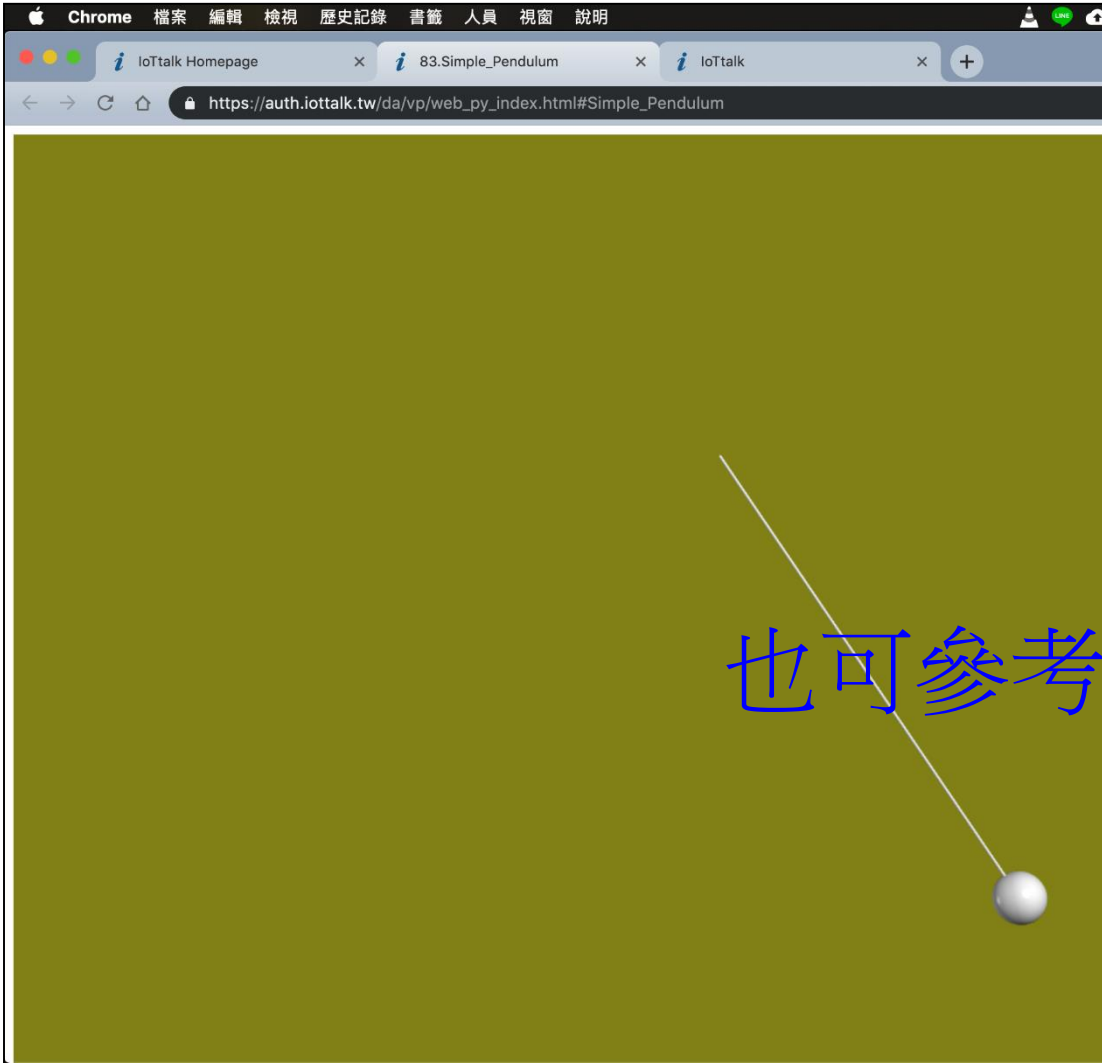


```
graph LR; Device1["C9:B4:01:AB:F3:...", Acceleration A, Gyroscope G] --- Join1((Join 1)); Device1 --- Join2((Join 2)); Device2["42.Ball-Spin", Friction F, Speed S]; Join1 --- Device2; Join2 --- Device2;
```

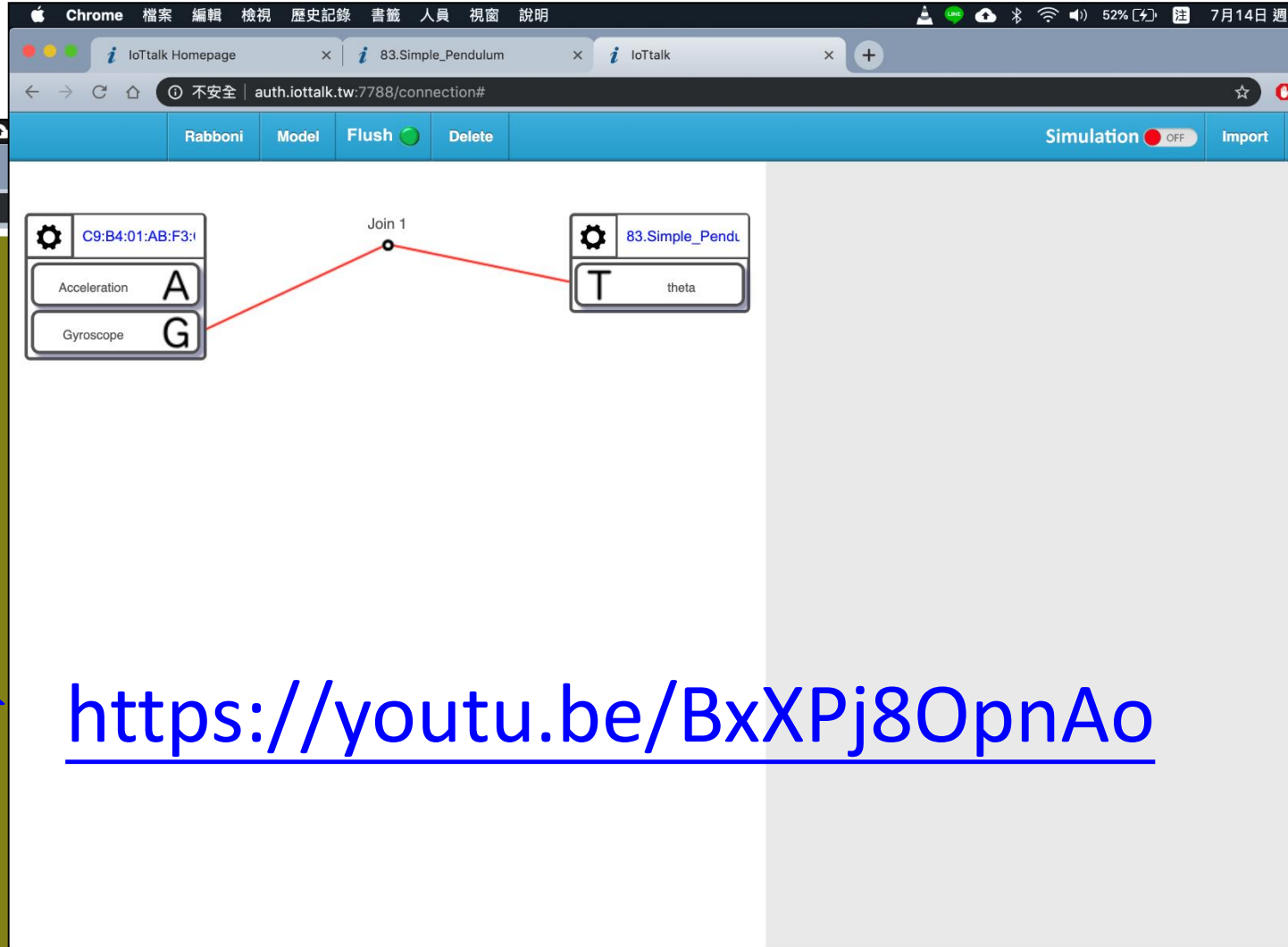
# 隔空乒乓球



# 單擺運動



也可參考



<https://youtu.be/BxXPj8OpnAo>



農譯 AgriTalk 科技智慧農業系統結合農場場域 IoT 監控系統、農業 AI 以及農用製劑配方研發三大面向，其中農業 AI 包含土壤菌相與肥力預測、病害預測及蟲害預測等三項預測系統。透過農譯 AgriTalk 平台可有效管理農地生產作物品質的控管，並利用 AI 系統提供農場管理決策建議，達到提早防範，並提供相對應的農用製劑配方研發，不僅預警問題也提供友善解方，開創完善綜合性的無毒科技務農系統

# Arduino Yún (或類似)

## 2. 農譯AIOT平台

雲端農業預測分析

## 1. 農譯田間感測器

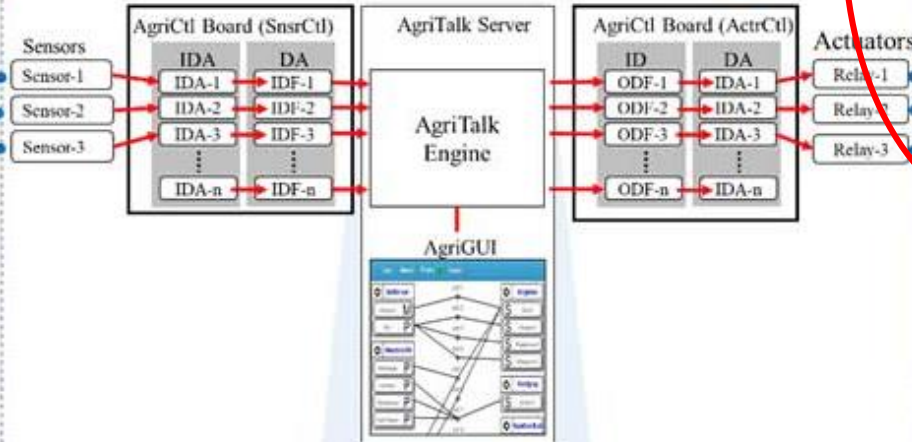
監控農場、收集數據



- 土壤環境
- 大氣環境

## 3. 土壤菌相與AI施肥系統

病蟲害AI預測系統



## 4. 農譯智慧控制模組

智慧化精準施肥管理、澆灌管理



- 噴灑系統
- 滴管系統

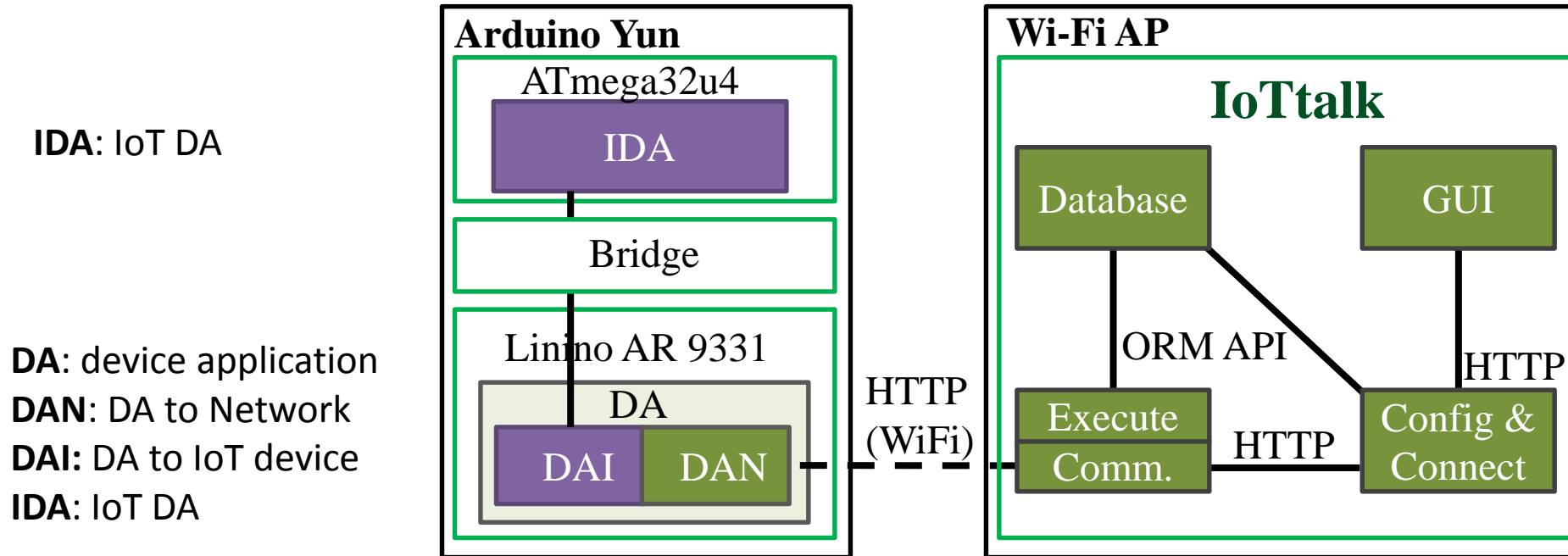
## 5. 農譯智慧控制模組

遠距離掌握農地資訊



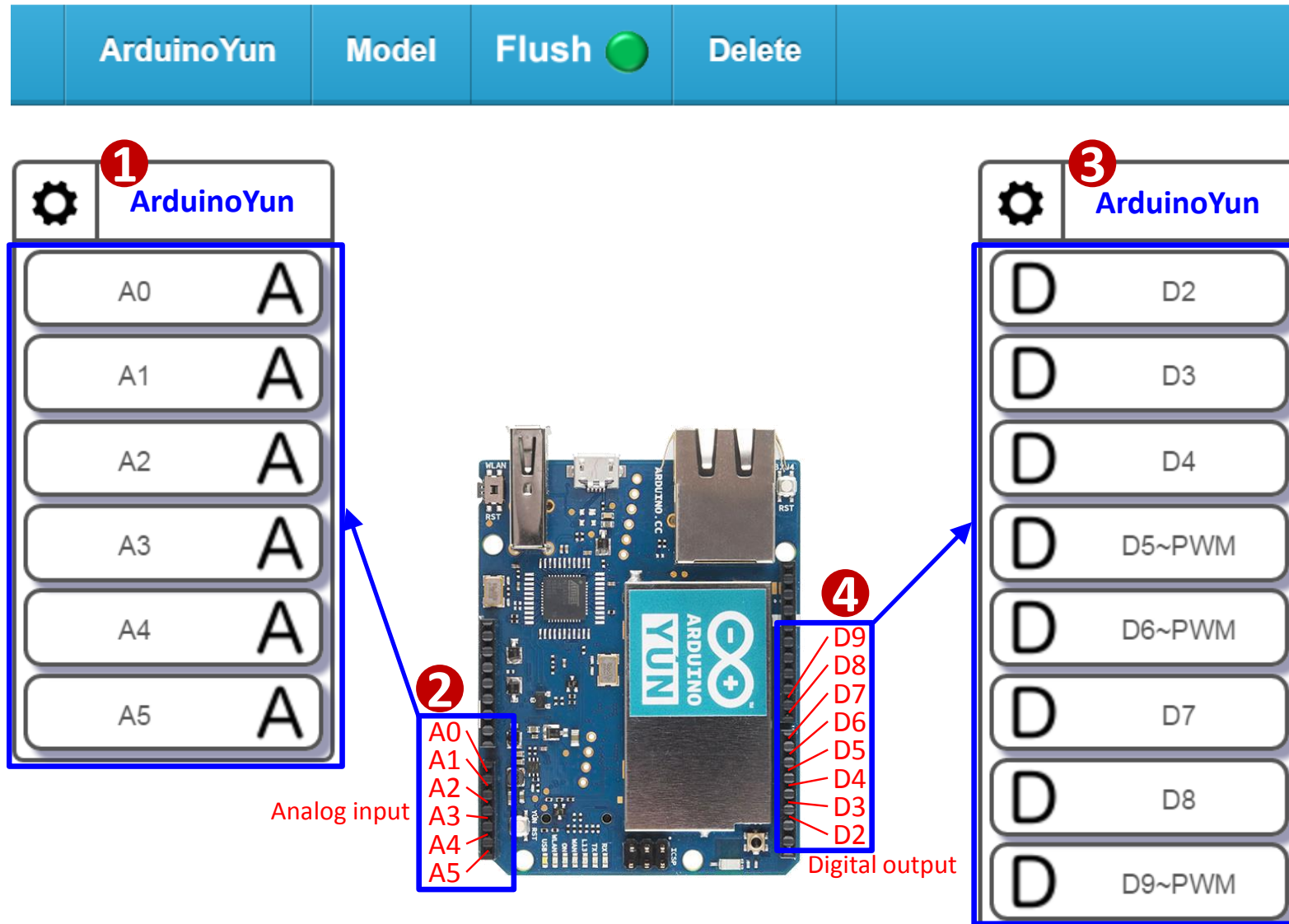
- 大氣數據回報
- 土壤數據回報
- 農業預測結果

# IoTtalk and Arduino Yún (1/2)





# IoTtalk and Arduino Yún (2/2)

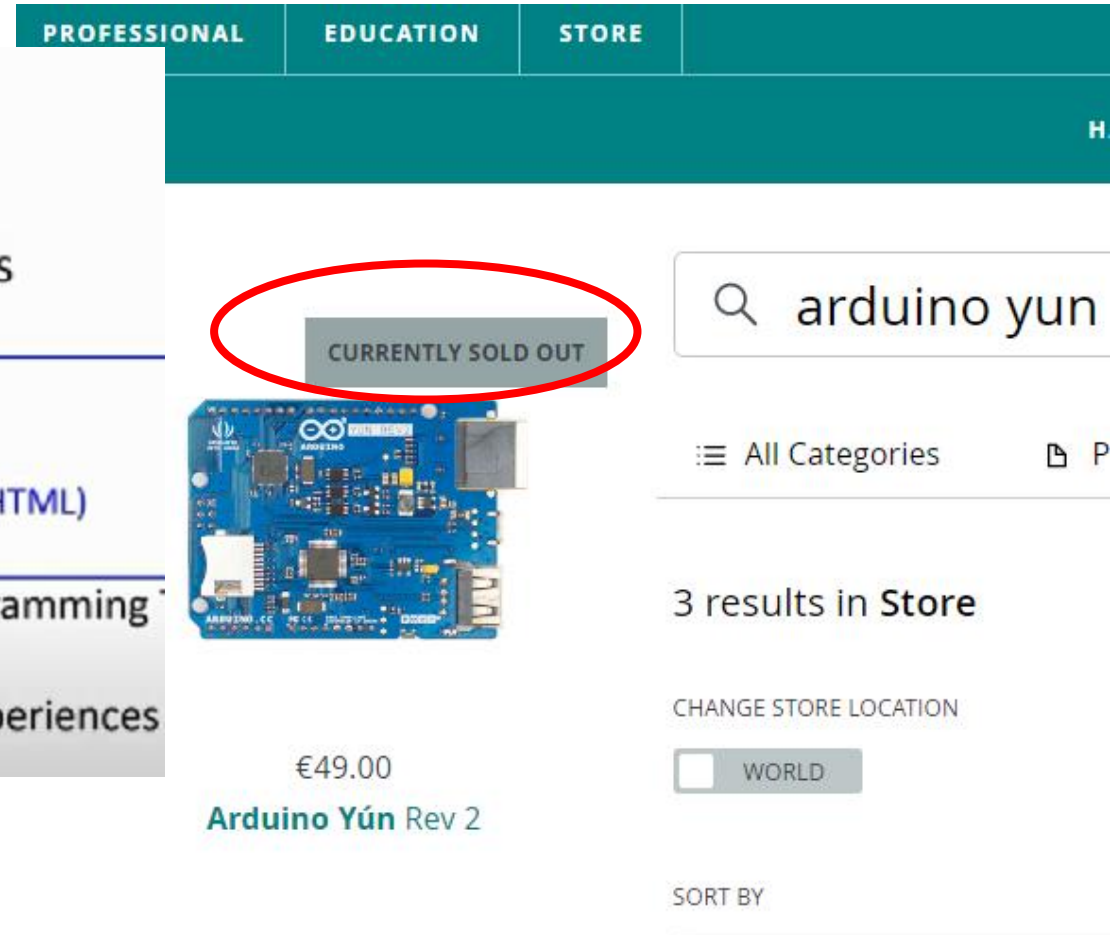


# Arduino Yún 不是雲

## Agenda (大綱)

- **Arduino compatibles again**
- **Arduino Yún and Compatible Boards**
- **Upgrade / ReFlash your Yún ?**
- **Programming with Arduino Yún**
- **ArduTalk\_for\_ArduinoYún**
  - The ArduTalk program on MCU (C/C++ and HTML)
  - The ArduTalk program on MPU (Python)
- **Arduino Tutorial, References and programming**
  - Getting Started vs. Reference Manual
  - Arduino Programming Tips (some Experiences)

<https://youtu.be/CURNzXINdxU>  
<https://reurl.cc/aNpXOI>



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€49.00

Arduino Yún Rev 2

# Iottalk Servers

- <https://demo.iottalk.tw>                      <https://iottalk.vip/6>
- <https://test.iottalk.tw>                      <https://map.iottalk.tw/map>
- **自行安裝 iottalk server**
  - 需要取得交大林一平教授研發團隊授權
  - 請洽團隊辦公室, (03)5712121#52904 交大分機52904
  - <https://reurl.cc/NR8Kx> (即 **iottalk.vip/0#QANDA**)



# 物聯網(IoT)簡介與 IoTtalk平台初體驗



謝謝捧場

[tsaiwn@cs.nctu.edu.tw](mailto:tsaiwn@cs.nctu.edu.tw)

蔡文能



<https://iottalk.vip/000/>

