Webbit 教育版

AI影像辨識體驗

講師：鳳山科技中心 傅仲儀主任

2020/12/16

Webbit教育版(離線版)

- 下載網址：Google搜尋 “WebBitSetup.exe”

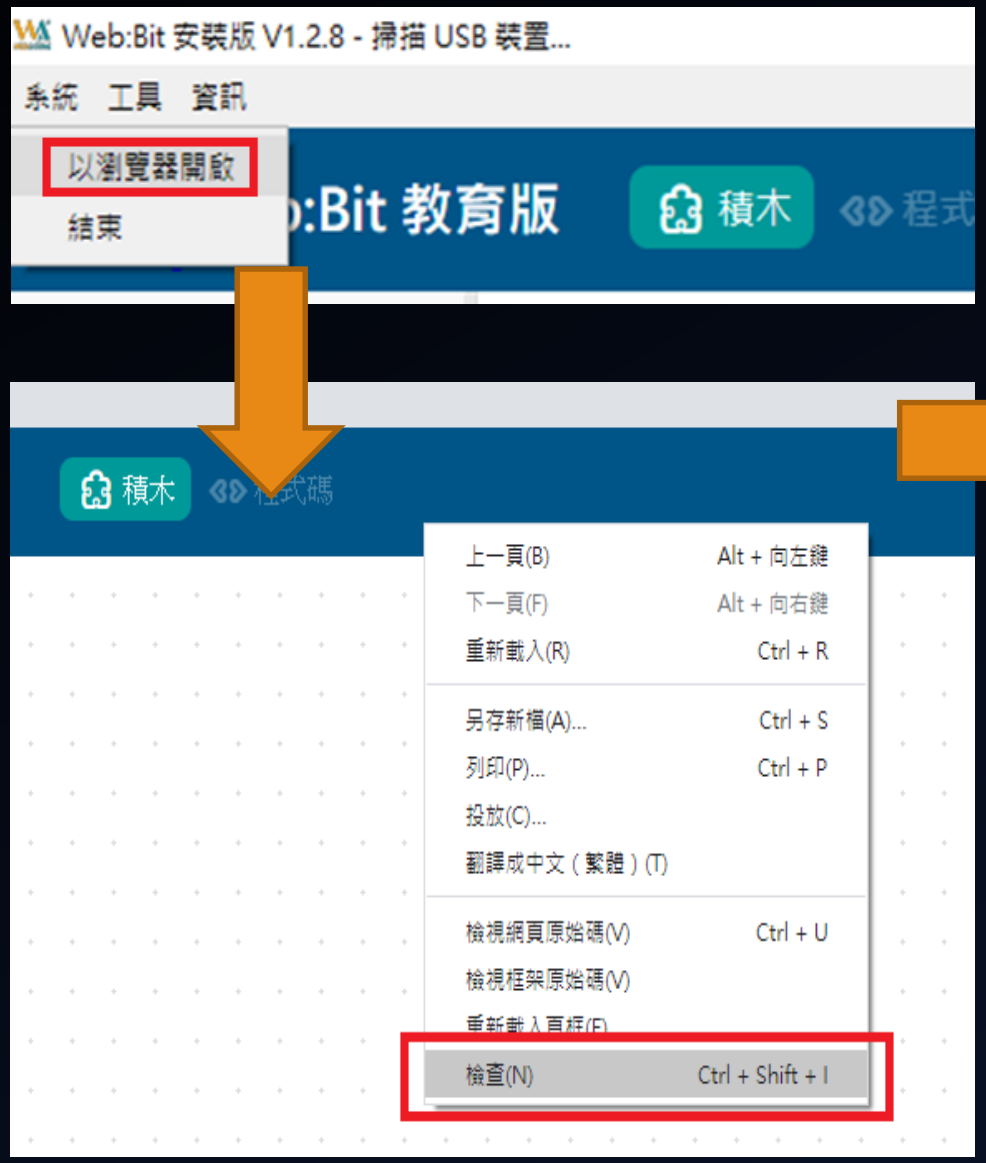
  離線版：https://ota.webduino.io/WebBitInstaller/WebBitSetup.exe

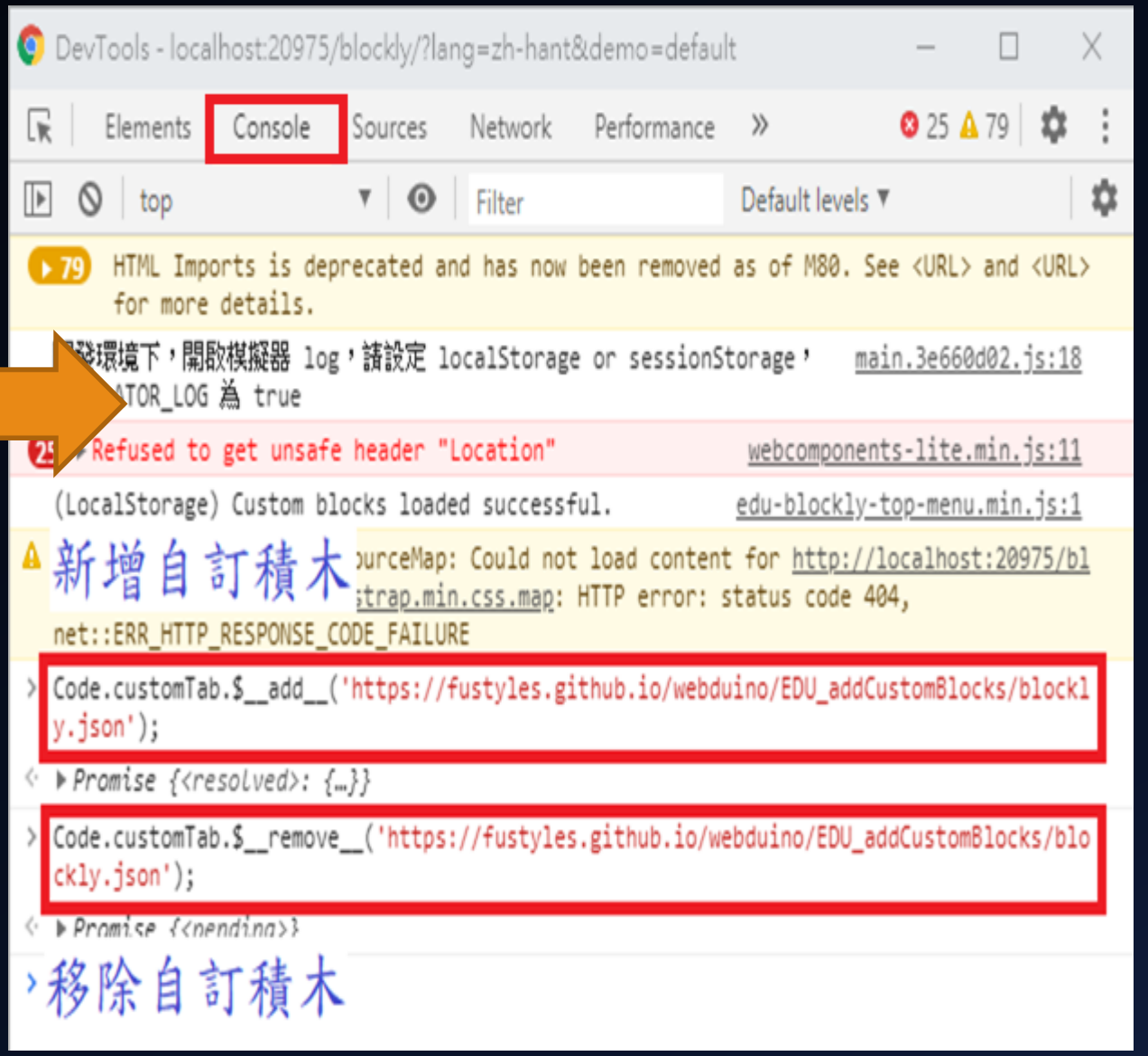
  網頁版：https://webbit.webduino.io/blockly/ (無法使用USB連線)
- 驅動程式：http://www.wch.cn/download/CH341SER_ZIP.html

  (離線版安裝已內建驅動程式)
- 更新韌體：https://webbit.webduino.io/tutorials/doc/zh-tw/education/info/ota.html

  (離線版接上Webbit後可自動偵測線上更新)

如何新增自訂積木 (影像辨識功能須以瀏覽器模式執行程式)





自訂積木設定清單
https://github.com/fustyles/webduino/blob/master/CustomBlock.txt

新增積木指令： Code.customTab.$__add__('積木連結');

移除積木指令： Code.customTab.$__remove__('積木連結');

Webbit教育版 & KebbixWebbit 新增自訂積木輔助積木

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/EDU_addCustomBlocks/blockly.json');
```

Web:Bit 教育版 - Webduino

Web:Bit 教育版 積木 程式碼 檔案 範例 擴充 教學 清空 更多 執行

- 自訂積木
- 變數
- 邏輯
- 重複
- 數學
- 文字
- 陣列
- 顏色
- 函式
- 怪獸控制
- 偵測
- 語音＆音效
- Web:Bit
- 開發板
- 矩陣 LED
- 按鈕開關
- 偵測光線＆溫度
- 音樂＆聲音
- 九軸體感偵測
- I/O 引腳
- 擴充功能

DevTools - localhost:20975/blockly/?lang=zh-hant&demo=default

Elements Console Sources Network Performance Memory Application Security Lighthouse 13 67

top Filter Default levels 14 hidden

91 messages
10 user mes...
13 errors
68 warnings
10 info
No verbose

開發環境下，開啟模擬器 log，請設定 localStorage or sessionStorage，SIMULATOR_LOG 為 true main.3e660d02.js:18

(LocalStorage) Custom blocks loaded successful. edu-blockly-top-menu.min.js:1

新增自訂積木

usb edu-blockly-top-menu.min.js:1

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/EDU_addCustomBlocks/blockly.json');
```

Promise {<fulfilled>: {…}}

```
Code.customTab.$__remove__('https://fustyles.github.io/webduino/EDU_addCustomBlocks/blockly.json');
```

移除自訂積木

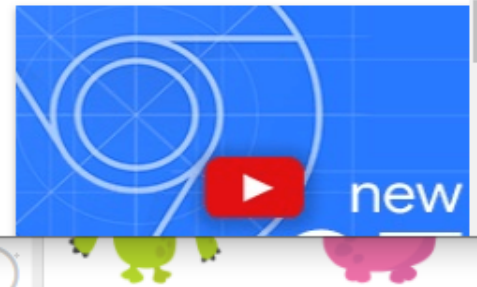
Console What's New ×

Highlights from the Chrome 87 update

New CSS Grid debugging tools
Debug and inspect CSS Grid with the new CSS Grid debugging tools.

New WebAuthn tab
Emulate authenticators and debug the Web Authentication API with the new WebAuthn tab.

Move tools between top and bottom panel



沒有新通知

webduino/... 2020.12.17... 11.21國教... 課程簡報2_... Web:Bit 安... Web:Bit 教... DevTools - ...

英 上午 08:59 2020/12/16

Web:Bit 教育版 - Webduino

Web:Bit 教育版 | 積木 | 程式碼 | 檔案 | 範例 | 擴充 | 教學 | 清空 | 更多 | 執行

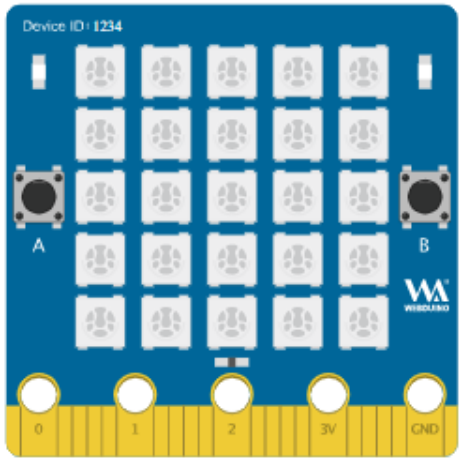
- 自訂積木
- 變數
- 邏輯
- 重複
- 數學
- 文字
- 陣列
- 顏色
- 函式
- 怪獸控制
- 偵測
- 語音＆音效
- Web:Bit
- 開發板
- 矩陣 LED
- 按鈕開關
- 偵測光線＆溫度
- 音樂＆聲音
- 九軸體感偵測
- I/O 引腳
- 擴充功能

自訂積木 網址 “ ”

自訂積木 網址 “ ”

- ✓
- add
- remove
- addAll
- removeAll
- addAll(New AI)
- removeAll(New AI)

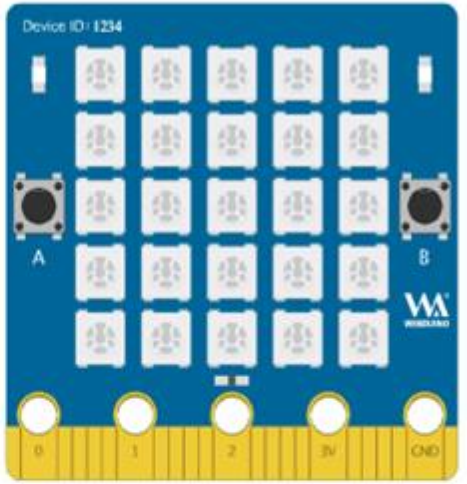
新增單一自訂積木
移除單一自訂積木
新增所有舊版自訂積木
移除所有舊版自訂積木
新增所有新版影像辨識自訂積木(支援ESP32-CAM)
移除所有新版影像辨識自訂積木(支援ESP32-CAM)



未命名 - 小畫... | webduino/C... | 2020.12.17_... | 11.21國教輔... | 課程簡報2_... | Web:Bit 安... | Web:Bit 教...

上午 09:06
2020/12/16

- 臉部偵測 (blazeface)
- 機器學習(knn-classifier)
- 臉部偵測 (face-api)
- 人臉辨識 (face-api)
- 物件偵測 (mobilenet)
- 機器學習 (自訂模型)
- QRcode辨識 (instascan)
- 顏色追蹤(Tracking)
- 追蹤人臉(Tracking)
- 物件偵測 (coco-ssd)
- 文字辨識 (tesseract.js)
- 姿態偵測 (posenet)
- 自訂積木
- 變數
- 邏輯
- 重複
- 數學
- 文字
- 陣列
- 顏色
- 函式
- 怪獸控制



(新版) 臉部偵測 (tfjs face-api.js)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/faceapi_detect_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/faceapi_detect_20201012/blockly.json');
```

(新版) 人臉辨識 (tfjs face-api.js)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/faceapi_recognize_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/faceapi_recognize_20201012/blockly.json');
```

(新版) 顏色偵測 (Tracking.js)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/trackingcolor_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/trackingcolor_20201012/blockly.json');
```

(新版) 文字辨識 (tesseract.js)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/tesseract.js_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/tesseract.js_20201012/blockly.json');
```

(新版) QR code辨識 (instascan)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/instascan.js_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/instascan.js_20201012/blockly.json');
```

(新版) 物件辨識 (tfjs coco-ssd)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/coco-ssd_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/coco-ssd_20201012/blockly.json');
```

(新版) 姿態偵測 (tfjs posenet)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/posenet_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/posenet_20201012/blockly.json');
```

(新版) 機器學習 (tfjs KNN-Classifier)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/knn-classifier_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/knn-classifier_20201012/blockly.json');
```

(新版) 機器學習 (tfjs teachablemachine)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/teachablemachine_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/teachablemachine_20201012/blockly.json');
```

(新版) 臉部偵測 (Tracking.js)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/trackingface_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/trackingface_20201012/blockly.json');
```

(新版) 臉部偵測 (tfjs blazeface)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/Blazeface_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/Blazeface_20201012/blockly.json');
```

(新版) 物件辨識 (tfjs mobilenet_20201012)

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/mobilenet_20201012/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/mobilenet_20201012/blockly.json');
```

遊戲元素

```
Code.customTab.$__add__('https://fustyles.github.io/webduino/GameElements_20190131/blockly.json');
Code.customTab.$__remove__('https://fustyles.github.io/webduino/GameElements_20190131/blockly.json');
```

Tensorflow.js(tfjs)介紹
https://www.tensorflow.org/js/

Tensorflow.js已訓練模型
https://github.com/tensorflow/tfjs-models

Tensorflow.js(tfjs) 示範網頁

物件辨識 (coco-ssd)

圖片

https://fustyles.github.io/webduino/TensorFlow/ObjectDetection_image/ObjectDetection_image_coco-ssd.html

視訊 (Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/ObjectDetection_video/ObjectDetection_video_coco-ssd.html

可辨識物件列表

https://github.com/tensorflow/tfjs-models/blob/master/coco-ssd/src/classes.ts

物件辨識 (mobilenet)

圖片

https://fustyles.github.io/webduino/TensorFlow/ObjectDetection_image/ObjectDetection_image_mobilenet.html

視訊 (Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/ObjectDetection_video/ObjectDetection_video_mobilenet.html

可辨識物件列表

https://github.com/tensorflow/tfjs-models/blob/master/mobilenet/src/imagenet_classes.ts

姿態辨識 posenet

圖片(單人)

https://fustyles.github.io/webduino/TensorFlow/PoseDetection_image/PoseDetection_image.html

圖片(多人)

https://fustyles.github.io/webduino/TensorFlow/PoseDetection_image/PoseDetection_image_multi.html

視訊(單人)(Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/PoseDetection_video/PoseDetection_video.html

視訊(多人)(Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/PoseDetection_video/PoseDetection_video_multi.html

BodyPix V1

圖片

https://fustyles.github.io/webduino/TensorFlow/BodyPix_image/BodyPix_image.html

視訊(Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/BodyPix_video/BodyPix_video.html

BodyPix V2

圖片

https://fustyles.github.io/webduino/TensorFlow/BodyPix_image/BodyPix2_image.html

視訊(Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/BodyPix_video/BodyPix2_video.html

Face Detection (face-api.js)

圖片

https://fustyles.github.io/webduino/TensorFlow/Face-api/Face-api_FaceDetection_image.html

視訊(Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/Face-api/Face-api_FaceDetection_video.html

Face Recognition (face-api.js)

圖片

https://fustyles.github.io/webduino/TensorFlow/Face-api/Face-api_FaceRecognition_image.html

視訊

https://fustyles.github.io/webduino/TensorFlow/Face-api/Face-api_FaceRecognition_video.html

DeepLab v3

圖片

https://fustyles.github.io/webduino/TensorFlow/ObjectDetection_image/ObjectDetection_image_deeplab.html

視訊(Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/ObjectDetection_video/ObjectDetection_video_deeplab.html

knn-classifier 手寫或匯入圖片訓練辨識(可訓練辨識數字)

https://fustyles.github.io/webduino/TensorFlow/DigitRecognition_knn-classifier/DigitRecognition_knn-classifier.html

knn-classifier 視訊深度學習

https://fustyles.github.io/webduino/TensorFlow/VideoRecognition_knn-classifier/VideoRecognition_knn-classifier.html

Blazeface

圖片

https://fustyles.github.io/webduino/TensorFlow/Blazeface_image/Blazeface_image.html

視訊(Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/Blazeface_video/Blazeface_video.html

Handpose

圖片

https://fustyles.github.io/webduino/TensorFlow/HandPoseDetection_image/handpose_image.html

視訊(Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/HandPoseDetection_video/handpose_video.html

Facemesh

圖片

https://fustyles.github.io/webduino/TensorFlow/FacemeshDetection_image/facemesh_image.html

視訊(Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/FacemeshDetection_video/facemesh_video.html

Teachable Machine

視訊(Chrome瀏覽器)

https://fustyles.github.io/webduino/TensorFlow/teachablemachine/teachablemachine.html

Tensorflow.js(tfjs) 應用網頁

馬賽克(tfjs BodyPix2)

- https://fustyles.github.io/webduino/TensorFlow/BodyPix_video/BodyPix2_blurothers_video.html

- 可選擇不馬賽克對象：
- 1. 第一個被偵測到的人臉
- 2. 人臉面積最大(最靠近鏡頭)
- 3. 全部馬賽克

隱身術(tfjs PoseNet)

- https://fustyles.github.io/webduino/TensorFlow/BodyPix_video/BodyPix2_blurothers_video.html

1. 點選按鈕"Capture background image"捕捉無人時畫面。
2. 兩手腕高於鼻子隱形
3. 兩手腕肩膀下靠很近(手腕交叉或合掌如影片)現形
4. 原理：利用姿態辨識設定條件識別姿態，隱形時顯示背景圖、現形時顯示視訊

背景特效(tfjs BodyPix2)

- https://fustyles.github.io/webduino/TensorFlow/BodyPix_video/BodyPix2_changebackground_video.html

1. 點選按鈕"Capture background image"捕捉無人時畫面。
   或者選擇載入本機背景圖
2. 原理：將視訊中有人的部分取出與靜態背景圖合併輸出影像

隱藏所有人(tfjs BodyPix2)

- https://fustyles.github.io/webduino/TensorFlow/BodyPix_video/BodyPix2_HidePersons_video.html

1. 點選按鈕"Capture background image"捕捉無人時畫面。
   或者選擇載入本機背景圖
2. 原理：將視訊有人的區域用對應靜態背景圖區域像素取代

其他影像辨識網頁範例

Tesseract.js (文字辨識)

圖片

https://fustyles.github.io/webduino/tesseract.js/Image2Text_image.html

視訊(Chrome瀏覽器)

https://fustyles.github.io/webduino/tesseract.js/Image2Text_video.html

Color Detection

視訊

https://fustyles.github.io/webduino/Tracking.js/tracking.js_DetectMask_MultiColor_video.html

Face Detection

視訊

https://fustyles.github.io/webduino/Tracking.js/tracking.js_DetectFace_video.html

Instascan.js (QR Code辨識)

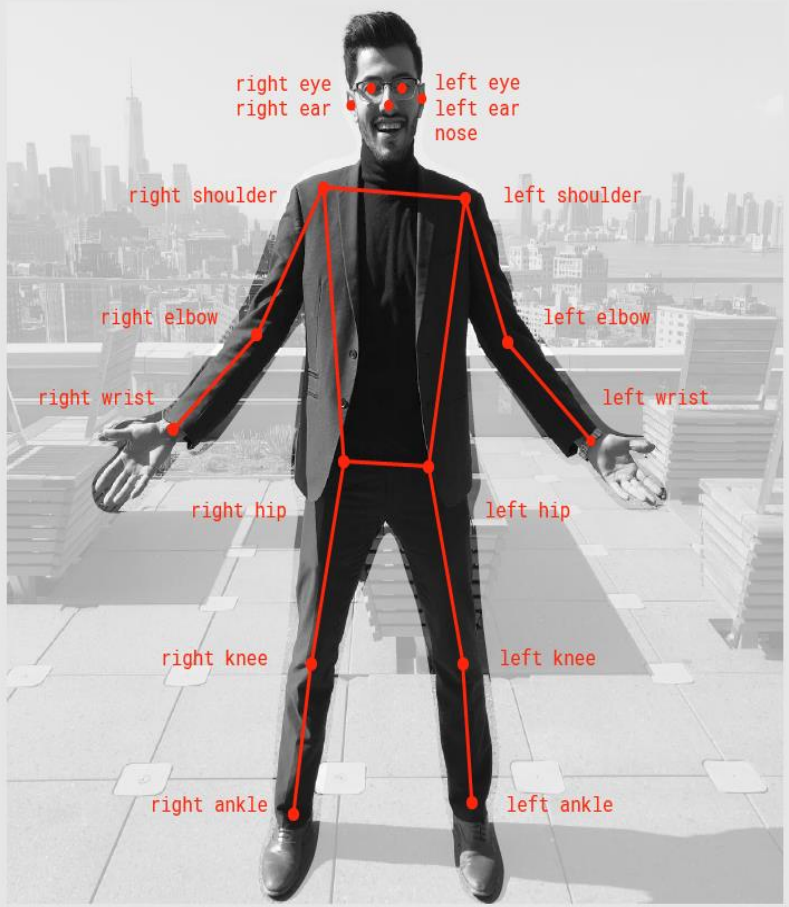
視訊(Chrome瀏覽器)

https://fustyles.github.io/webduino/Instascan.js/Instascan_qrcode.html

姿態辨識：

- Nose 鼻子
- Eye 眼睛
- Ear 耳朵
- Shoulder 肩膀
- Elbow 手肘
- Wrist 手腕
- Hip 臀部
- Knee 膝蓋
- Ankle 腳踝

17 Pose Keypoints
Returned by PoseNet



機器學習(Google Teachable Machine)

在Google Teachable Machine網站上可對影像、音訊、姿態做樣本的訓練，訓練後的模型可上傳雲端取得模型網址設定，使用於支援的平台、應用程式、APP、積木程式等。可應用於需分類影像、音訊、姿態的場景。

https://teachablemachine.withgoogle.com

Teachable Machine

teachablemachine.withgoogle.com

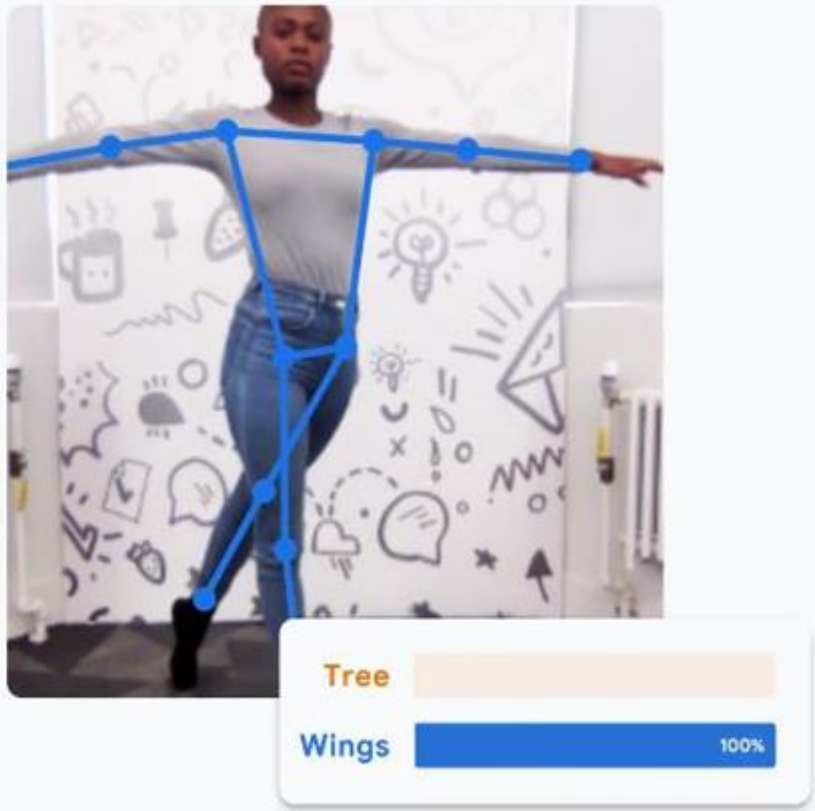
About FAQ Get Started

Teachable Machine

Train a computer to recognize your own images, sounds, & poses.

A fast, easy way to create machine learning models for your sites, apps, and more – no expertise or coding required.

Get Started



Teachable Machine

teachablemachine.withgoogle.com/train

Teachable Machine

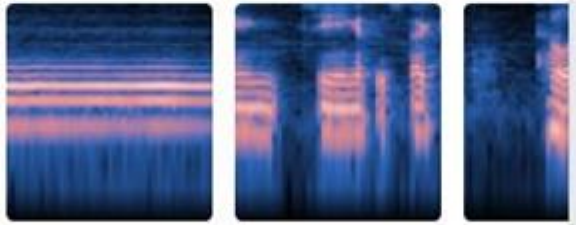
New Project

Open an existing project from Drive.

Open an existing project from a file.

Image Project

Teach based on images, from files or your webcam.



Audio Project

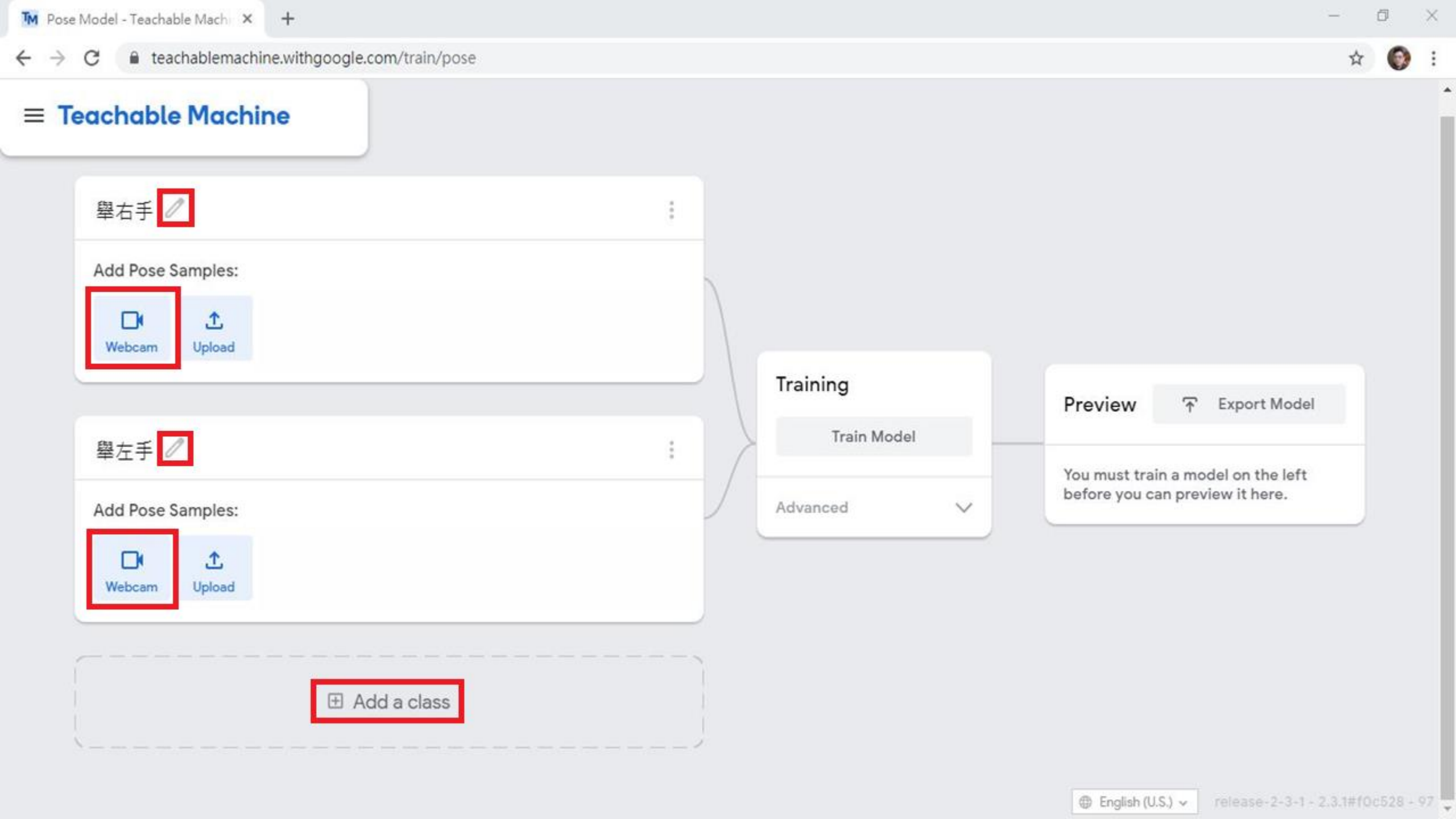
Teach based on one-second-long sounds, from files or your microphone.

Pose Project

Teach based on images, from files or your webcam.

English (U.S.)

release-2-3-1 - 2.3.1#f0c528 - 97


Pose Model - Teachable Mach
teachablemachine.withgoogle.com/train/pose
Teachable Machine
舉右手
Add Pose Samples:
Webcam
Upload
舉左手
Add Pose Samples:
Webcam
Upload
Add a class
Training
Train Model
Advanced
Preview
Export Model
You must train a model on the left before you can preview it here.
English (U.S.)

Pose Model - Teachable M

teachablemachine.withgoogle.com/train/pose

Teachable Machine

舉右手

Webcam

Hold to Record

20 Pose Samples

舉左手

Training

Train Model

Advanced

Preview

Export Model

You must train a model on the left before you can preview it here.

English (U.S.)

release-2-3-1 - 2.3.1#f0c528 - 97

Pose Model - Teachable M

teachablemachine.withgoogle.com/train/pose

Teachable Machine

Webcam

Hold to Record

24 Pose Samples

Add a class

Training

Train Model

Advanced

Preview

Export Model

You must train a model on the left before you can preview it here.

2. Train your Model

Now that you have two classes, you can train your model here (or add more classes).

English (U.S.)

release-2-3-1 - 2.3.1#f0c528 - 97

Pose Model - Teachable Mach

teachablemachine.withgoogle.com/train/pose

Teachable Machine

Don't switch tabs!
You must leave this tab open to train your model.
Don't show again OK

舉右手

20 Pose Samples

Webcam Upload

舉左手

24 Pose Samples

Webcam Upload

Add a class

Training

Training...

00:09 - 23 / 50

Advanced

Preview

Export Model

You must train a model on the left before you can preview it here.

English (U.S.)

release-2-3-1 - 2.3.1#f0c528 - 97

Pose Model - Teachable M

teachablemachine.withgoogle.com/train/pose

Teachable Machine

舉右手

20 Pose Samples

Webcam Upload

舉左手

24 Pose Samples

Webcam Upload

Add a class

Training

Model Trained

Advanced

Preview

Export Model

Input ON Webcam

Output

舉右手

舉左手 100%

English (U.S.)

release-2-3-1 - 2.3.1#f0c528 - 97

Pose Model - Teachable M

teachablemachine.withgoogle.com/train/pose

Teachable Machin

舉右手

20 Pose Samples

Webcam Upload

舉左手

24 Pose Samples

Webcam Upload

Export your model to use it in projects.

Tensorflow.js

Export your model:

Upload (shareable link) Download Upload my model

Your sharable link:

https://teachablemachine.withgoogle.com/models/[...]

When you upload your model, Teachable Machine hosts it at this link for free. (FAQ: Who can use my model?)

Code snippets to use your model:

Javascript Contribute on Github

Learn more about how to use the code snippet on github.

Copy

```
<div>Teachable Machine Pose Model</div>
<button type="button" onclick="init()">Start</button>
<div><canvas id="canvas"></canvas></div>
<div id="label-container"></div>
<script src="https://cdn.jsdelivr.net/npm/@tensorflow/tfjs@1.3.1/dist/tf.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/@teachablemachine/pose@0.8/dist/teachablemachine-
pose.min.js"></script>
<script type="text/javascript">
    // More API functions here:
    // https://github.com/googlecreativelab/teachablemachine-community/tree/master/libraries/pose
```

Export Model

ON Webcam

100%

Pose Model - Teachable M

teachablemachine.withgoogle.com/train/pose

Teachable Machin

Export Model

舉右手

20 Pose Samples

Webcam Upload

舉左手

24 Pose Samples

Webcam Upload

ON Webcam

100%

Export your model to use it in projects.

Tensorflow.js

Export your model:

Upload (shareable link) Download Update my cloud model

Your sharable link:

https://teachablemachine.withgoogle.com/models/dRyteoagd/ Copy

When you upload your model, Teachable Machine hosts it at this link for free. (FAQ: Who can use my model?)

✓ Your cloud model is up to date.

Code snippets to use your model:

Javascript Contribute on Github

Learn more about how to use the code snippet on github.

Copy

```
<div>Teachable Machine Pose Model</div>
<button type="button" onclick="init()">Start</button>
<div><canvas id="canvas"></canvas></div>
<div id="label-container"></div>
<script src="https://cdn.jsdelivr.net/npm/@tensorflow/tfjs@1.3.1/dist/tf.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/@teachablemachine/pose@0.8/dist/teachablemachine-
pose.min.js"></script>
<script type="text/javascript">
```

Teachable Machine

What is this?

This link hosts a machine learning model created using Teachable Machine, a tool that makes it easier for anyone – teachers, students, artists, makers of all kinds – to train machine learning models.

How does it work?

Machine learning models are trained on examples (e.g., images, sounds, poses) gathered by the creator. Their results depend on the data they've been trained on.

Want to use this model in your project?

See this link to learn how to use Teachable Machine models in your projects.

Report this model:

If you have concerns about this model, email us at teachablemachine-support@google.com.

This model:

teachablemachine.withgoogle.com/models/WGn0TMhv7/

Preview this model live

Input ON Webcam

Output

不舉手

舉右手

舉左手