

AI電腦視覺與Scratch



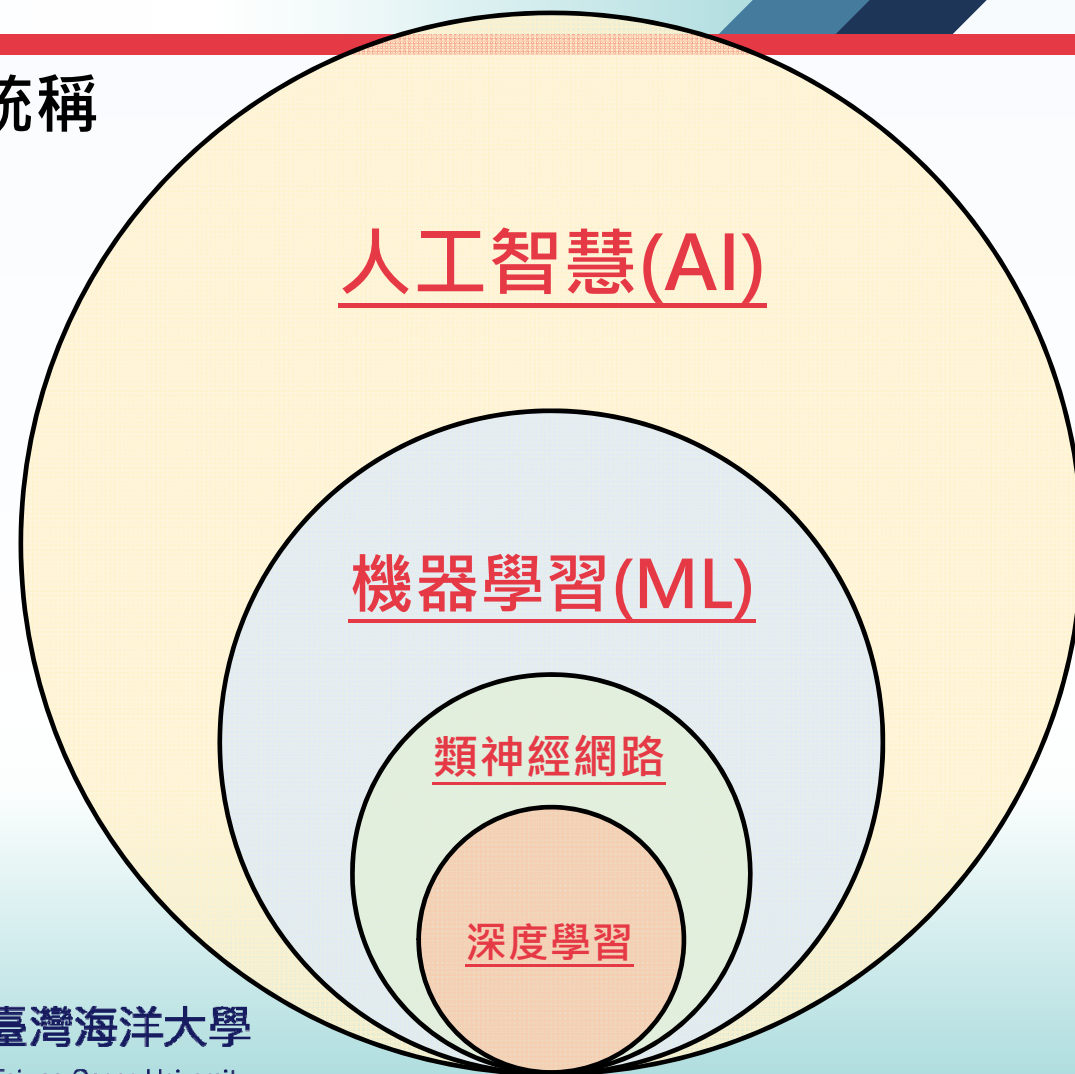
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<https://ailearning.ntou.edu.tw/zh-tw/>

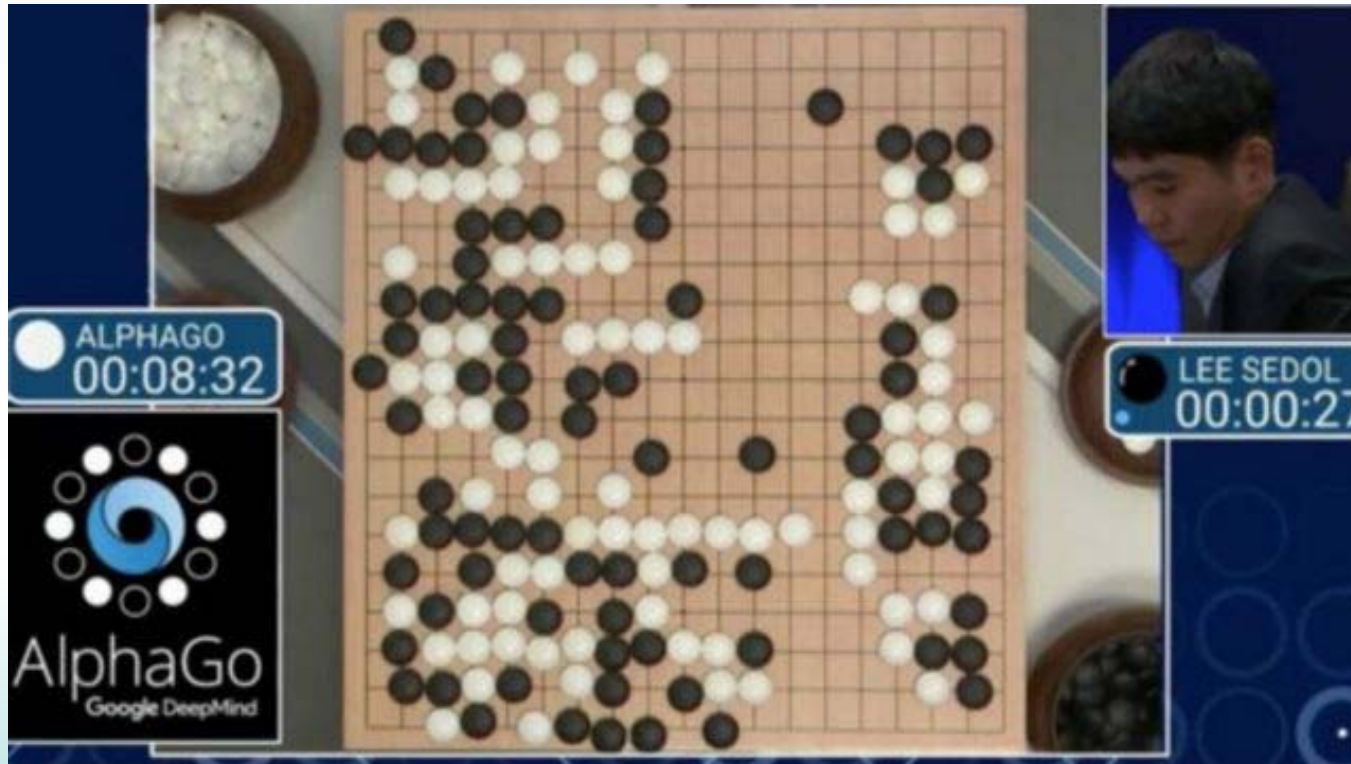
什麼是AI？

- Artificial Intelligence (AI)是一統稱
 - 自動化
 - 自然語言
 - 智能機械



AlphaGO

- 2016年 Google DeepMind公司發展ALPHAGO打倒世界棋王李世石



為什麼電腦會越來越厲害？

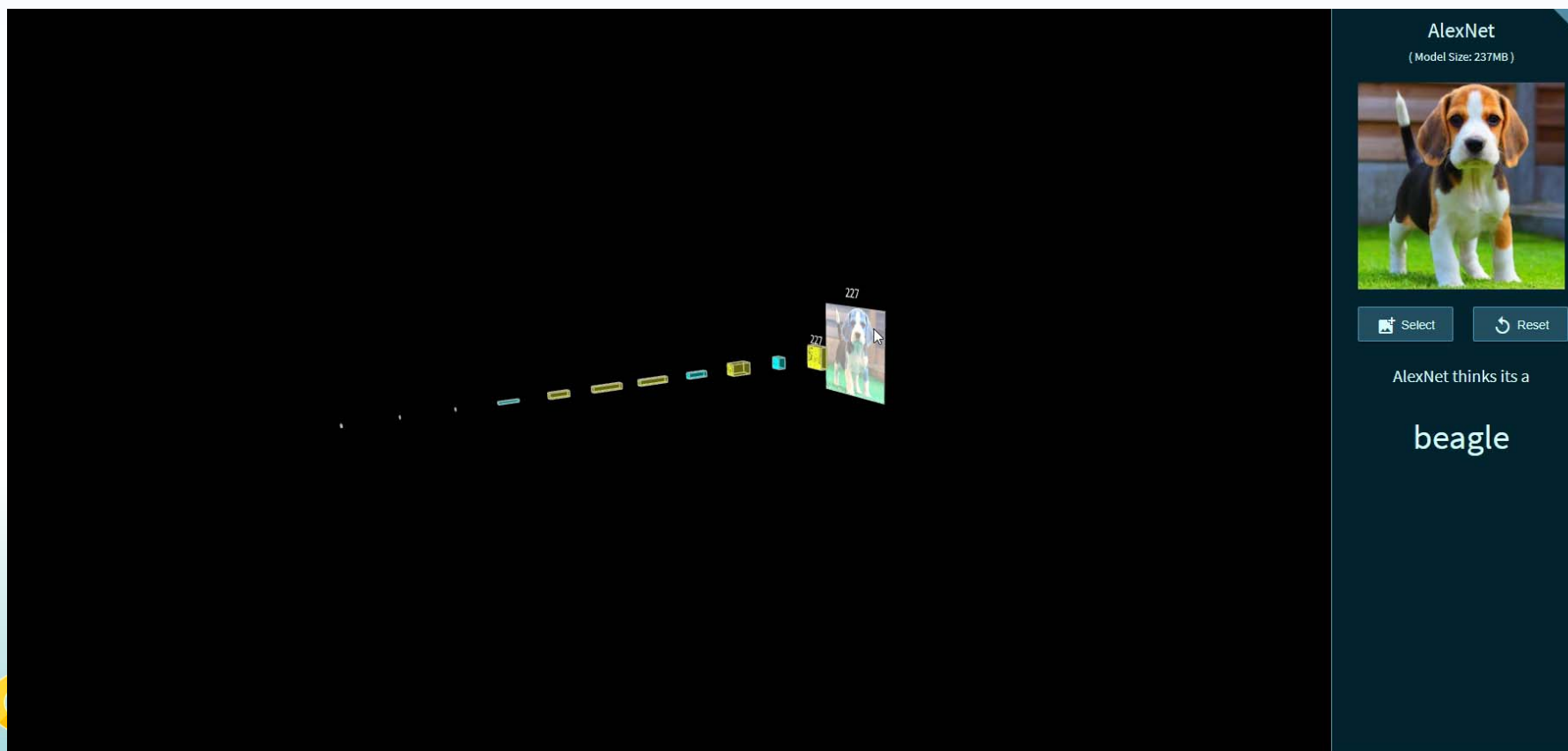
- <https://www.youtube.com/watch?v=Z6fjTZAtziQ&list=LL&index=8>



什麼是電腦視覺？

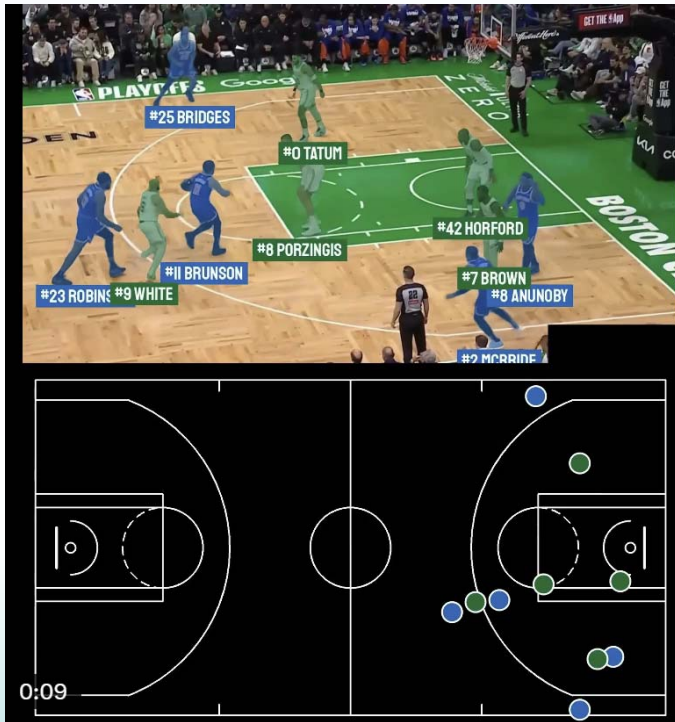
TensorSpace.js

- 電腦看到畫面後，分析出重要資訊

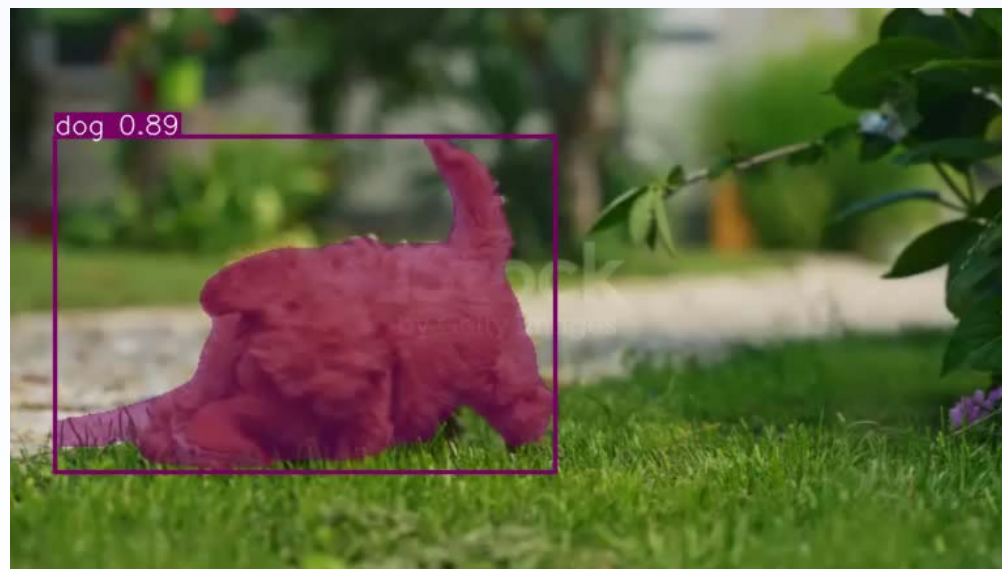
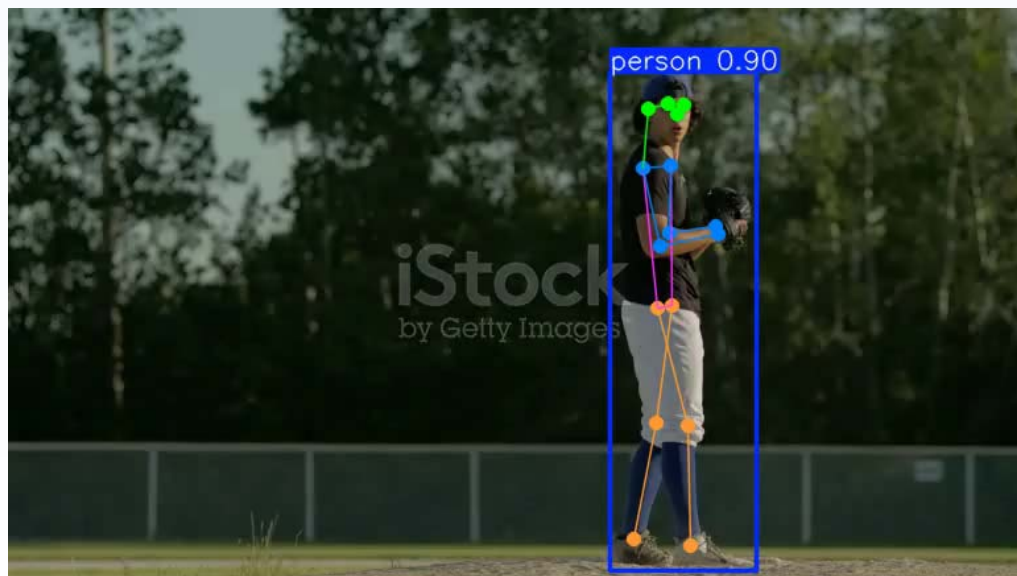


The image shows a screenshot of a neural network visualization interface. On the left, a dark background displays a series of colored boxes representing layers in a neural network, with a small image of a beagle being processed. On the right, a dark blue panel displays the results of the AlexNet model. The panel includes the text "AlexNet (Model Size: 237MB)", a small image of a beagle, and two buttons labeled "Select" and "Reset". Below the image, the text "AlexNet thinks its a" is followed by the word "beagle" in a large font.

電腦視覺可以做什麼？

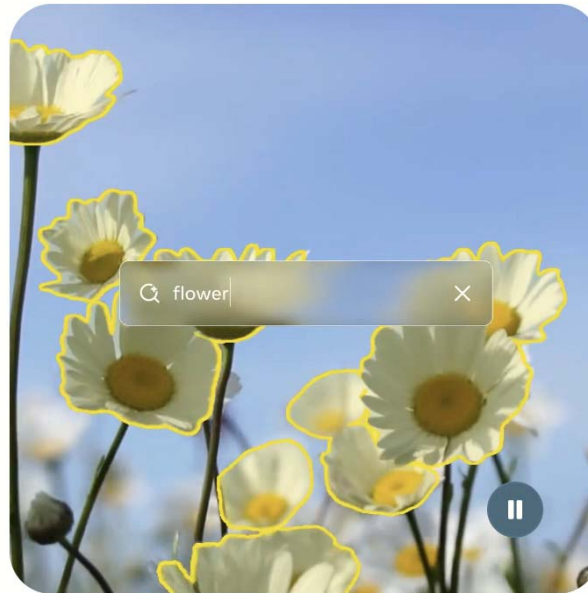


電腦視覺可以做什麼？



電腦視覺會不會很難？

- SAM3
- <https://aidemos.meta.com/segment-anything>
- 可以輸入文字，AI幫你找出物體
- 告訴電腦你在找什麼，他幫你找出更多



Text prompts

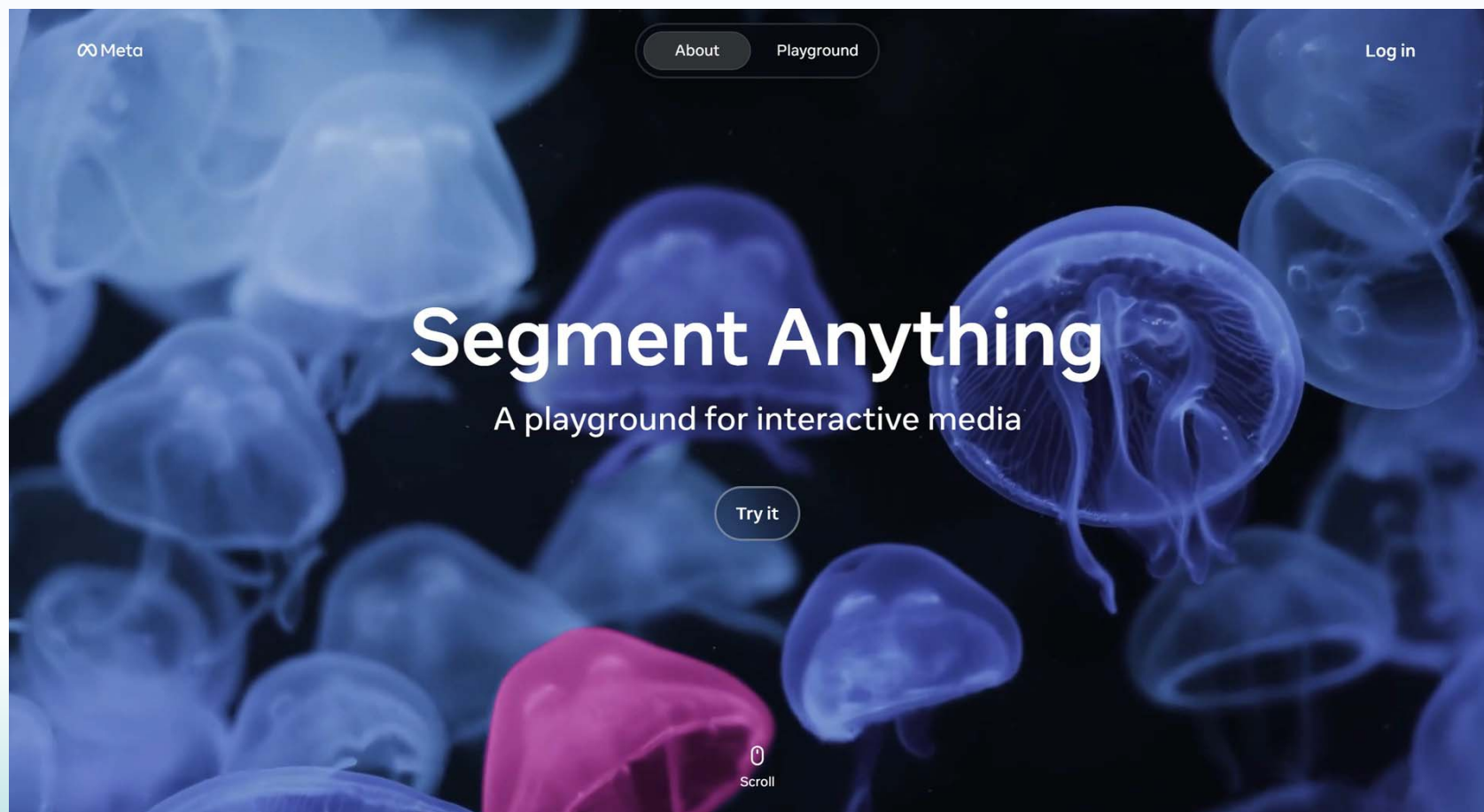
You can prompt SAM 3 with words and short phrases, to mask all objects matching the text description.



Exemplar Prompts

With exemplar prompts, you can simply draw a box around an example of the object you want to segment, and SAM 3 will mask all objects matching the outlined example.

你也可以自己上去SAM3玩



還可以...

➤ 從照片變成3D模型

The screenshot shows the SAM Playground web interface. At the top, there is a navigation bar with "Segment Anything" on the left, "About" and "Playground" buttons in the center, and "Log in" on the right. Below the navigation bar, the "Playground" section is titled "Playground" with the subtitle "Start from scratch or use a ready-made template." There are five main interactive cards arranged horizontally:

- Create video cutouts**: Includes a video camera icon and a "SAM 3" button.
- Create image cutouts**: Includes an image icon and a "SAM 3" button.
- Create 3D scenes**: Includes a 3D cube icon and a "SAM 3D" button.
- Create 3D bodies**: Includes a stick figure icon and a "SAM 3D" button.
- Isolate sounds**: Includes a headphones icon and a "SAM Audio" button.

Below these cards is a "Featured templates" section with the subtitle "Handpicked templates we think you'll love". It displays three template thumbnails:

- A person in a hat with white outlines.
- A soccer player kicking a ball with a glowing red foot.
- Two people wearing 3D glasses.

Teachable Machine

- Google Creative Lab 推出的免費線上工具，不用寫程式就能用自己的資料（影像、聲音、肢體姿勢）訓練分類模型，直接在瀏覽器完成訓練與測試
- 可以製作影像分類、聲音分類、姿勢辨識專案，把模型輸出接到遊戲或互動作品

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

Tree 69%

Wings 15%

What is Teachable Machine?

實作步驟

- 1. 訓練一個看得出你身體擺動的電腦模式
- 2. 在Scratch 上使用這個模式

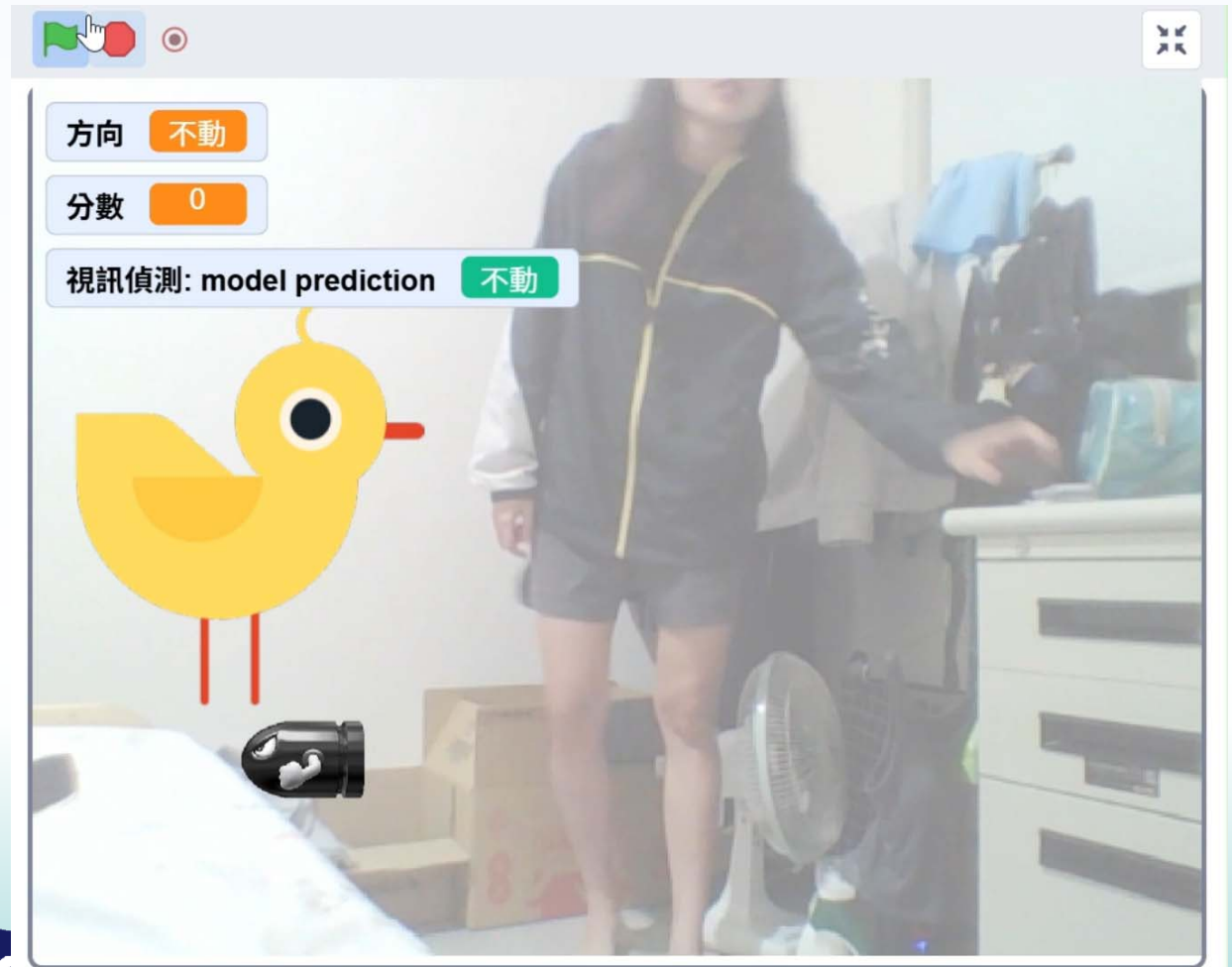


TEACHABLE
MACHINE



實作範例

- 躲飛彈遊戲
- 1. 鏡頭辨識人物動作
- 2. 控制造型蹲下或跳起
- 3. 躲過一次飛彈得一分
- 4. 碰到飛彈，遊戲結束



實作範例

- 接蘋果遊戲
- 1. 鏡頭辨識人物動作
- 2. 移動身體，控制人物移動
- 3. 接到蘋果加一分
- 4. 碰到蜘蛛遊戲結束



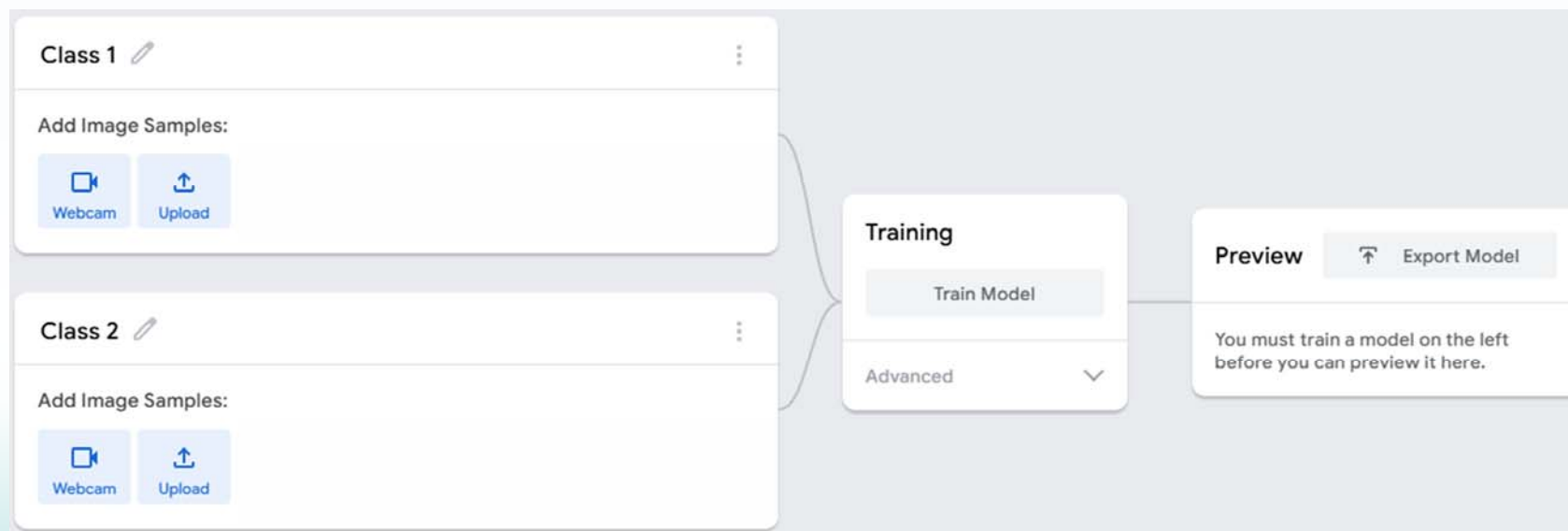
Teachable Machine

(教電腦看世界)



1. Teachable machine

1. 匯入或拍攝想要辨識的照片
2. 訓練模型
3. 試試看



寫類別 → 拍攝照片 → 按下訓練模式

The screenshot shows the Teachable Machine interface with three classes: 'right', 'left', and 'middle'. Each class has a 'Webcam' button and an 'Upload' button. A 'Training' panel is open, showing a 'Train Model' button and an 'Advanced' dropdown. A 'Preview' panel is also visible, with a message: 'You must train a model on the left before you can preview it here.' Red arrows point from the 'left' class to the 'Train Model' button.

試試看效果

This model: [Teachable Machine 連結](#)

teachablemachine.withgoogle.com/models/ONUffNGJq/

Teachable Machine

right

4 Pose Samples



left

4 Pose Samples



middle

4 Pose Samples



Training

Model Trained

Advanced

模型測試

Preview

Export Model

Input

ON

Webcam



Output

right 100%

left

middle

English

release-2-4-10 - 2.4.10#4

範例：手指姿態辨識

Teachable Machine

New Project

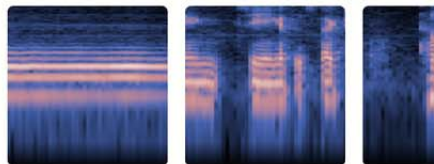
Open an existing project from Drive.

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.

2. 在Scratch中使用

➤ <https://playground.raise.mit.edu/create/>

The image shows a Scratch 3.0 workspace with a script on the left and an extension selection panel on the right. The script consists of the following blocks:

- 當 旗幟被點擊 (When green flag clicked)
- 變數 direction 設為 0 (Set variable direction to 0)
- 變數 scroe 設為 0 (Set variable scroe to 0)
- use model Paste URL Here! (Use model block)

The extension selection panel, titled "選擇擴充功能" (Choose an extension), displays various options. The "TEACHABLE MACHINE" extension is highlighted with a red box. A red arrow points from the "TEACHABLE MACHINE" extension to the "use model" block in the script. A red box also highlights the "Scratch" icon in the bottom-left corner of the workspace.

Available extensions in the panel include:

- TEACHABLE MACHINE: Use Google Teachable Machine models in your Scratch project.
- Hand Sensing: Sense hand movement with the camera.
- Face Sensing: Sense face movement with the camera.
- Body Sensing: Sense body position with the camera.
- 音樂 (Music): 演奏樂器與節拍 (Play instruments and rhythm).
- 畫筆 (Drawing): 使用你的角色來畫圖 (Use your character to draw).
- 視訊偵測 (Image Recognition): 使用攝影機偵測動作 (Use camera to detect actions).
- 文字轉語音 (Text-to-Speech): 讓你的專案能夠說話 (Let your project talk).
- 翻譯 (Translation): 將文字訊息翻譯為各國語言 (Translate text messages into various languages).
- Makey Makey: 把任何東西變成鑰匙 (Turn anything into a key).

Logos for Jupyter CO and National Taiwan Ocean University are visible at the bottom of the slide.

換你們做做看!

- 1. 先從SAM3開始玩
- 2. Teachable Machine練習
- 3. 連結到Scratch
- 4. 回去想想看還可以做什麼？

Questions?

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