

指導老師:王村益 ▲

電子狗

ELETRONIC DOG

組員:
林子程
陳冠宇 ▼
鄭有博
簡子宸

組員介紹



林子程

語音辨識
人工智慧學習



陳冠宇

硬體組裝
報告製作



鄭有博

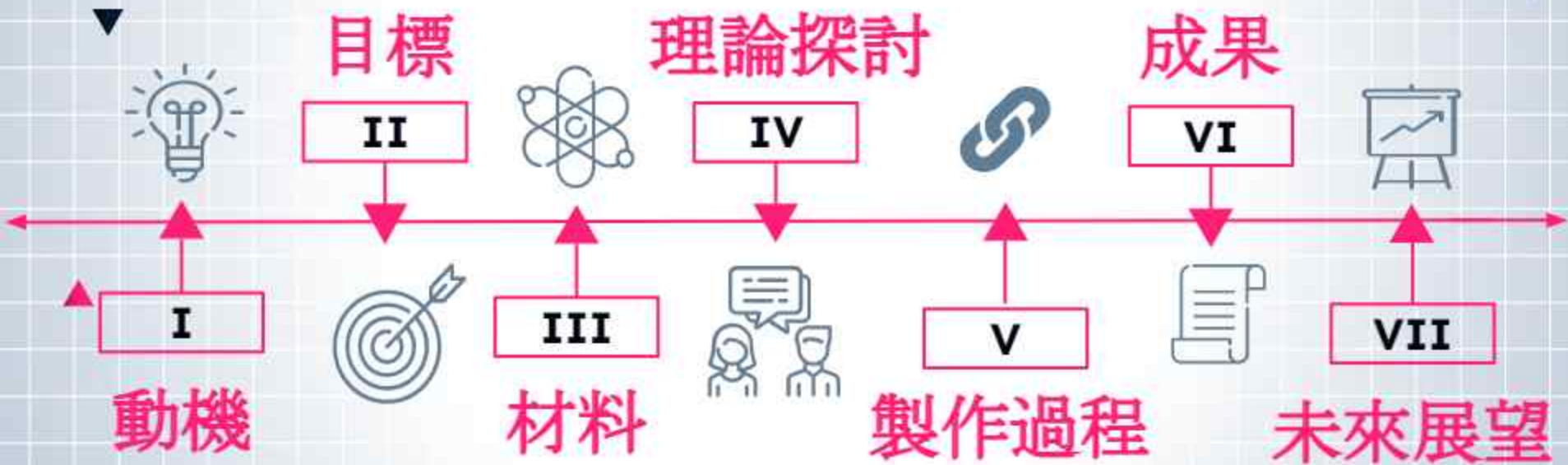
馬達電路設計
馬達程式撰寫



簡子宸

感測元件電路設計
感測元件程式撰寫

組織架構



The background features a light gray grid pattern. Scattered across the grid are various geometric shapes: solid triangles in shades of pink, cyan, and black, as well as hollow triangles with black outlines. Some of these hollow triangles have small colored triangles (pink or cyan) positioned at their vertices. The central focus is the large, bold Japanese characters '動機' (Dōgi), which translates to 'motivation' or 'reason'.

動機



155,869
隻流浪狗在外流浪



7,000
隻在動物收容所



200,000,000
每年專門處理流浪動物相關的預算



人身安全

環境衛生

野生動物
被攻擊

PROBLEMS

噪音問題

疾病防疫

經濟負擔



The background features a light gray grid pattern. Scattered across the grid are various geometric shapes, primarily triangles, in shades of pink, cyan, and black. Some triangles are solid, while others are outlined. The central focus is the large, bold Chinese characters '目標' (Goal).

目標

主要功能



聲音辨識



馬達控制



方向判斷

The background features a light gray grid pattern. Scattered throughout are various geometric shapes: solid triangles in shades of pink, cyan, and black, as well as hollow triangles with black outlines. Some of these shapes are layered, creating a sense of depth. The central focus is the large, bold Chinese characters '材料' (Material) in a vibrant pink color.

材料

MEGA2560



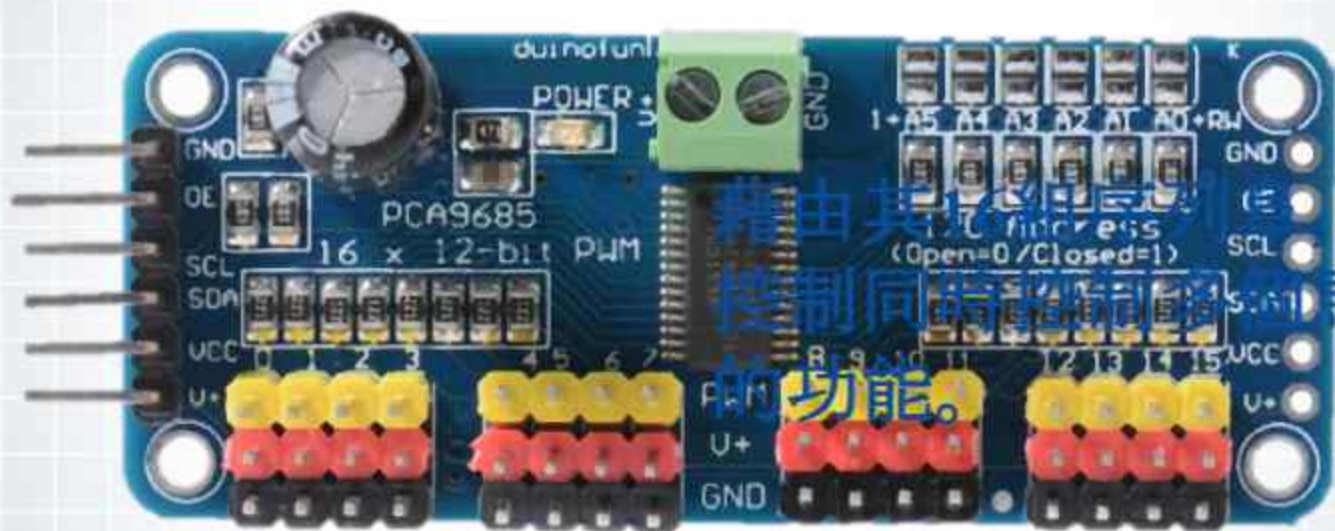
的運作和接
言虎，為整

MG996R



接收MEGA 2560的指令，
執行電子狗的動作。

PCA9685



藉由其
控制
的功能。

達到
馬達

LM386模組



和判斷聲音強度, 仍用四顆LM386來判斷聲音的方向。

DFPlayer

DFPlayer Mini

接收來自NANO電路的信號，同時播放預先燒錄的狗叫聲。

18650 V8電池擴充板

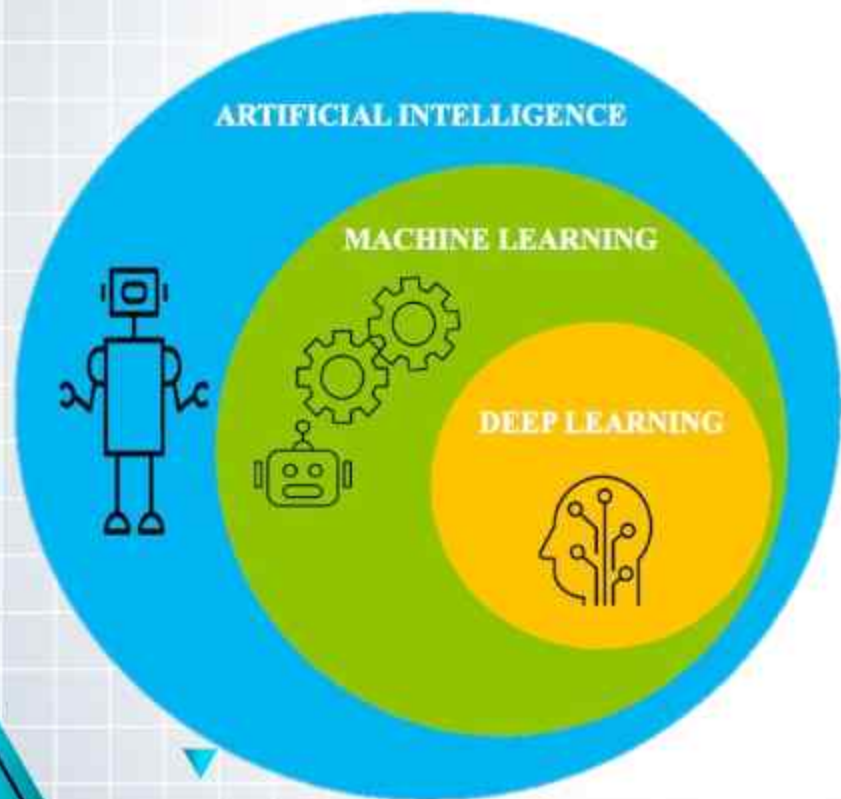




The background features a light gray grid pattern. It is decorated with various geometric shapes: large solid triangles in pink and cyan, smaller hollow triangles in black and cyan, and small solid triangles in pink and black scattered throughout. The central text is in a bold, pink, sans-serif font.

理論探討

機器學習



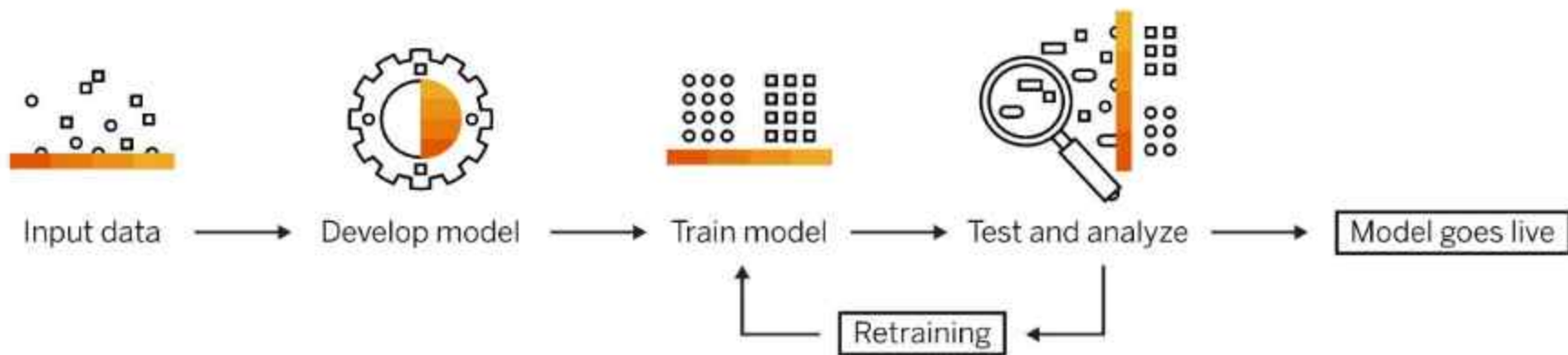
監督式學習

非監督式學習

半監督式學習

強化式學習

機器學習運作過程



聲音辨識

特徵提取



建立資料



模型搭建



訓練模型

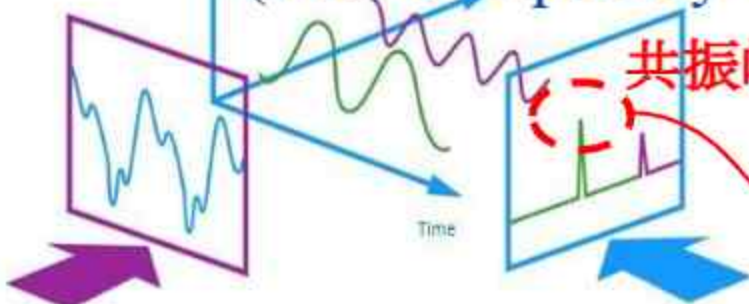
特徵提取方法

Amplitude

梅爾頻率倒譜係數MFCC

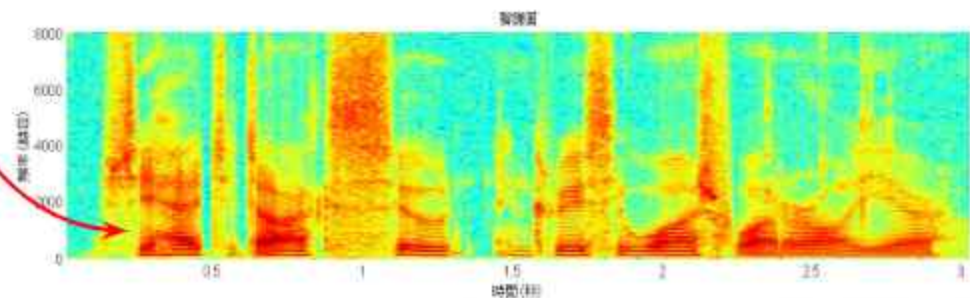
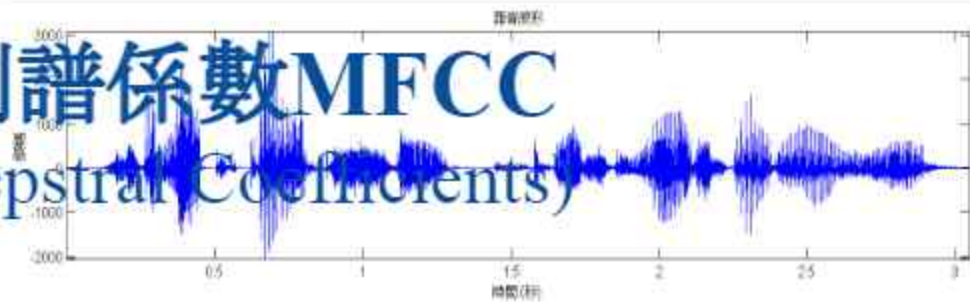
(Mel-Frequency Cepstral Coefficients)

共振峰

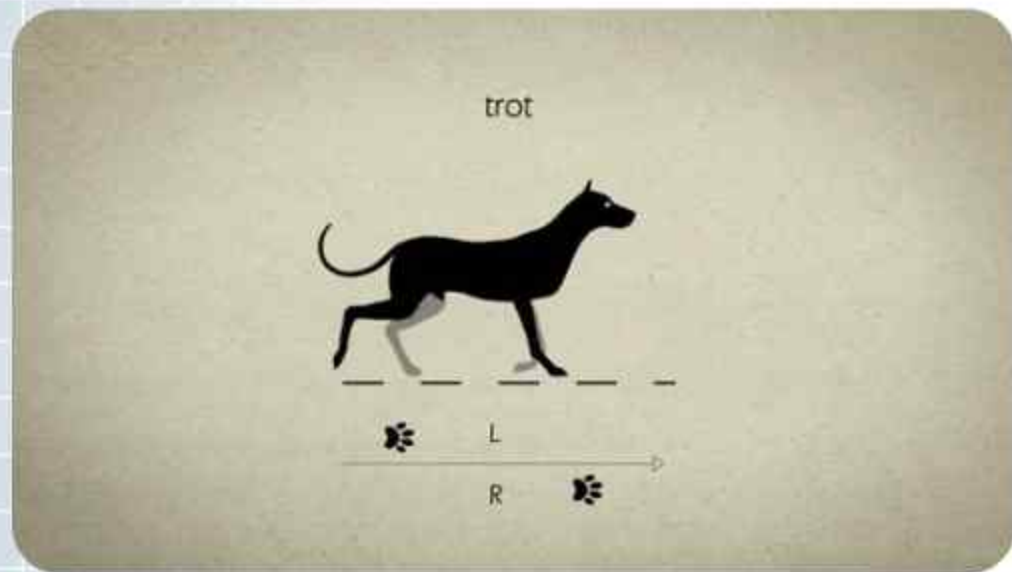


Time Domain
Amplitude vs. Time

Frequency Domain
Amplitude vs. Frequency



狗的運動方式

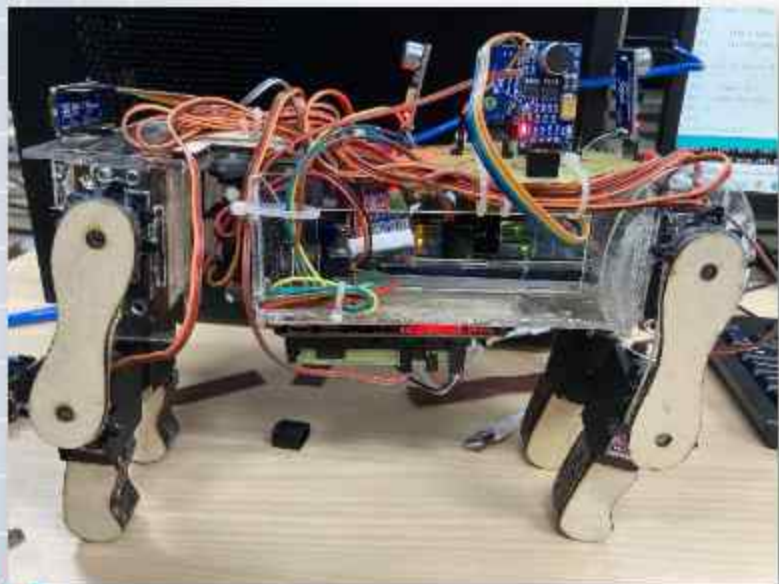


Trot
是狗最有效的步態

The background features a light gray grid pattern. Scattered throughout are various geometric shapes: solid triangles in shades of pink, cyan, and black, as well as hollow triangles with black outlines. Some of these shapes are nested or overlapping, creating a layered, modern aesthetic. The central text is rendered in a bold, pink, sans-serif font.

製作過程

外觀製作



聲音辨識

特徵提取



建立資料



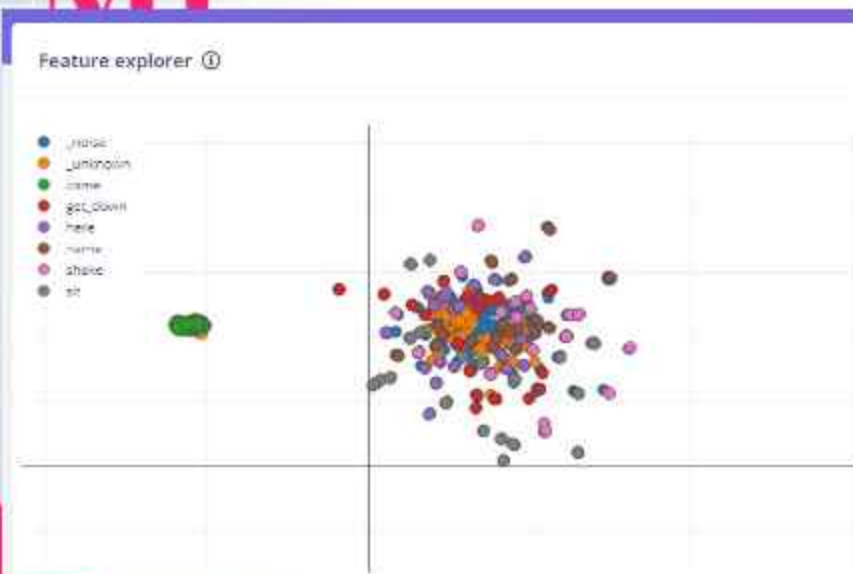
模型搭建



訓練模型

機器學習

MIT



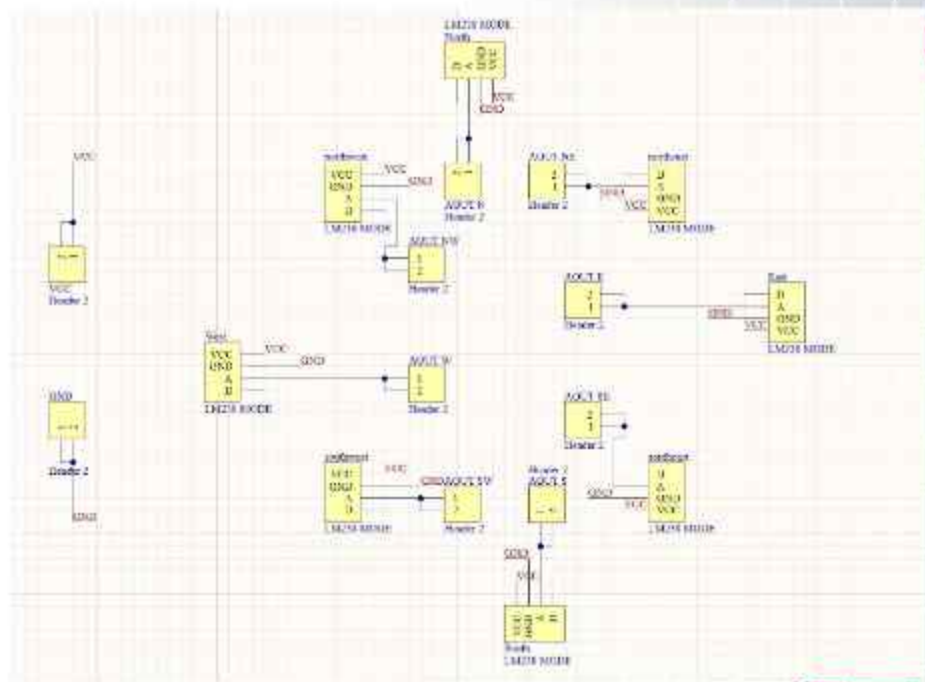
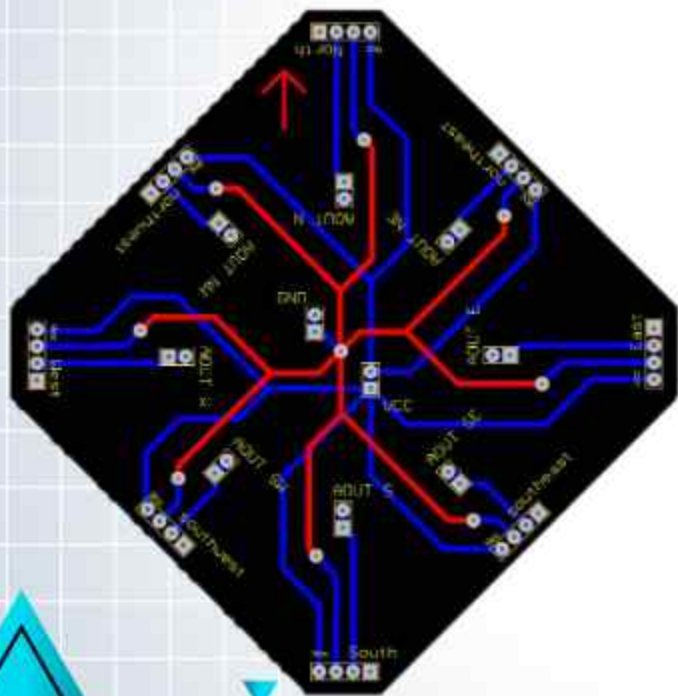
EDGE IMPULSE

Create library

Turn your impulse into optimized source code that you can run on any device.

 C++ library	 Arduino library	 C library
 WebAssembly	 TensorRT library	 Micro library
 SenseView library	 NewTT Model	 TISL-41 library
 Synaptic Tools Component		

LM386方向辨識



印刷



曝光



蝕刻



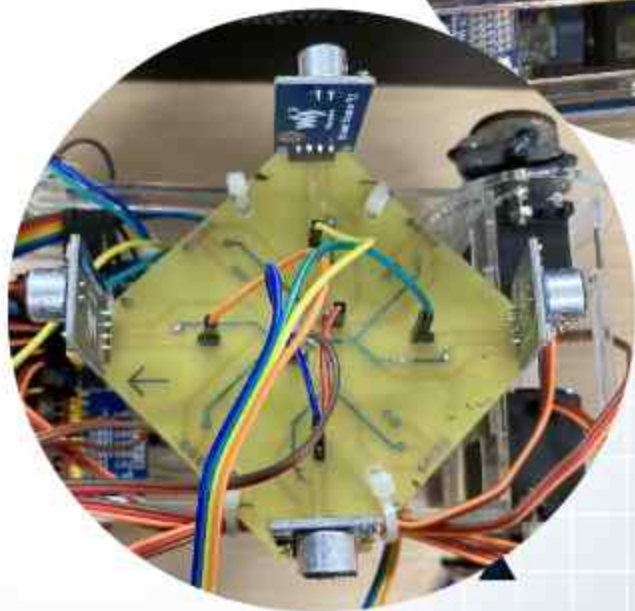
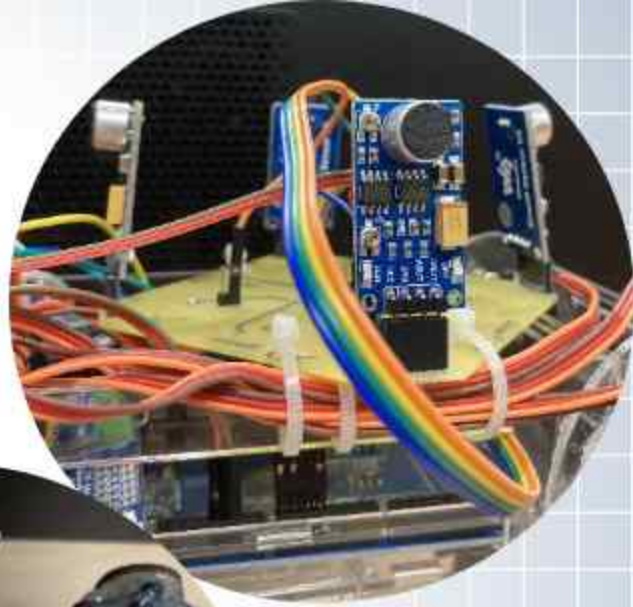
顯影



鑽孔

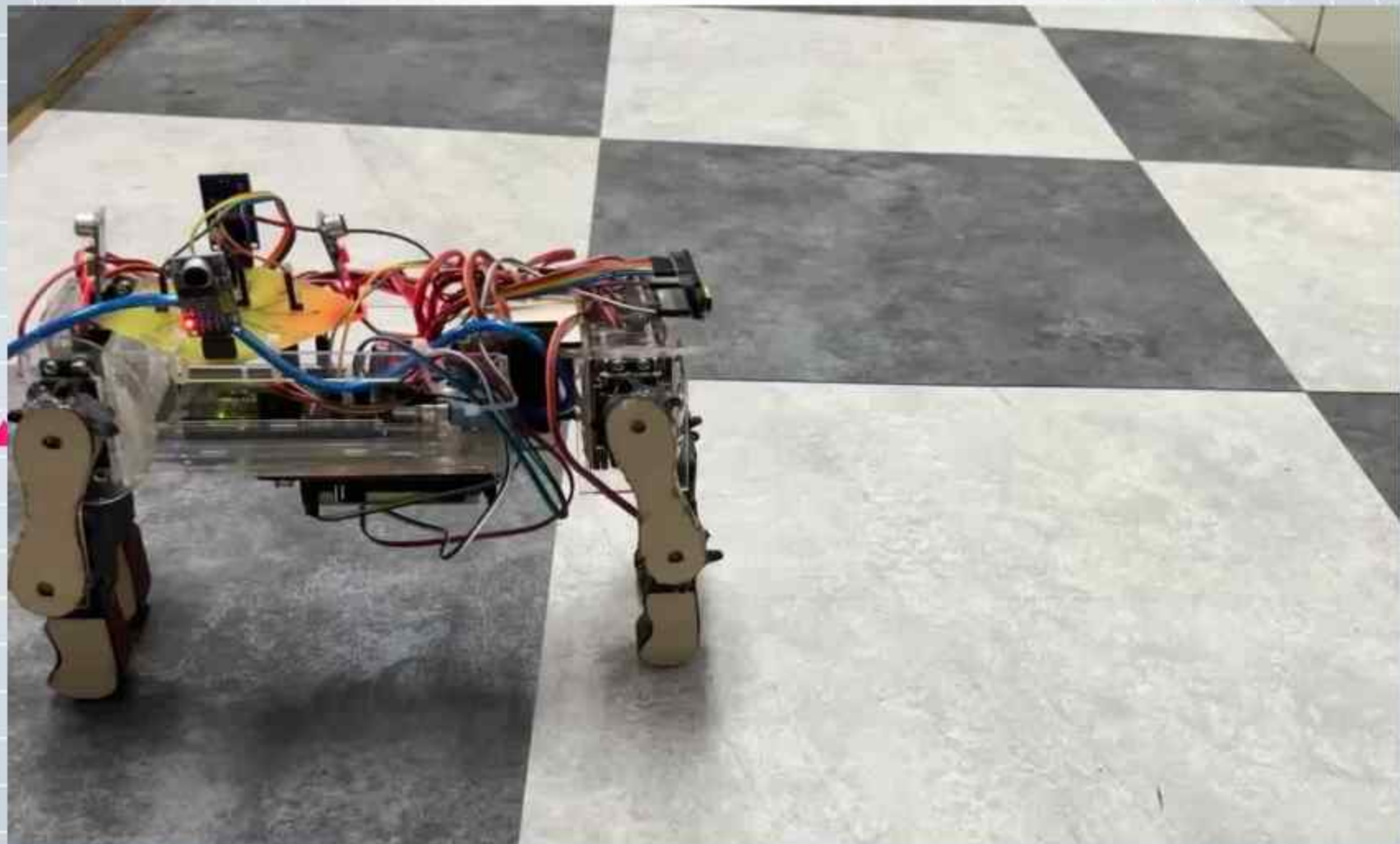


焊接



The background features a light gray grid pattern. It is decorated with various geometric shapes, primarily triangles, in shades of pink, cyan, and black. Some triangles are solid, while others are hollow with black outlines. The shapes are scattered across the page, with larger ones in the corners and smaller ones in the center. The central text '成果' is rendered in a bold, pink, sans-serif font.

成果





未來展望

未來展望



外觀更貼近實體



選用更堅固的材料



新增更多的語音指令



運動過程更流暢



參考資料來源

<https://web.ee.nthu.edu.tw/p/16-1175-11508.php?Lang=zh-tw>

<https://www.twblogs.net/a/5cd953c3bd9eee67a77fae99>

<https://tw.news.yahoo.com/%E5%8F%B0%E7%81%A3%E6%B5%81%E6%B5%AA%E5%8B%95%E7%89%A9%E5%95%8F%E9%A1%8C-070000200.html>

<https://e-info.org.tw/node/232004>

<https://www.796t.com/content/1550332657.html>



The background features a light gray grid. Scattered throughout are various geometric shapes: large triangles in pink, cyan, and black, some overlapping; smaller triangles in the same color palette; and a white triangle with a black outline. The text 'Q&A' is centered in a pink, cursive font.

Q&A

The background features a light gray grid. Scattered throughout are various geometric shapes: large triangles in pink, cyan, and black, some with white outlines; smaller solid triangles in the same color palette; and some overlapping shapes. The central text is in a bold, black, sans-serif font.

感謝聆聽!