組別 Team ID：2025-21

專題屬性 Category：AIoT 應用（AIoT Applications）

專題名稱 Project：具影音互動介紹之物聯網應用（An IoT-Based Application with Multimedia Interaction）

一、**指導老師 Advisor：**陳榮靜老師（Dr. Rung-Ching Chen）

二、 **組員 Team members：**王裕瑋（11114155）、王翌丞（11114059）、黃永樂（11114176）、王品懿（11114047）、蘇妍蓓（11114104）

三、 **系統環境 System environment：**

（一）軟體 Software：

作業系統 Operating System：Windows 11、Android 10 / iOS 13、Raspberry Pi OS

語言 Programing language：TypeScript、Python

開發工具 Toolkits：Visual Studio Code、Expo CLI & Expo Go、Android Studio、Node.js（v16 以上）、Git（版本控管）

（二）硬體 Hardware：

CPU：Intel Core i5 第 8 代以上（建議 i7-12700F 或更高；硬碟：40G；記憶體：8G RAM；顯示器：17 以上。

四、 **簡介：**

《具影音互動介紹之物聯網應用》專題共分為《智慧居家安全篇》與《居家智慧植栽篇》兩個主題篇章。以物聯網技術為核心，展現智慧家電在居家安全監測與生活照護上的創新應用。

（一）系統簡述（居家智慧植栽篇）

《居家智慧植栽篇》是結合 IoT 與智慧家電技術的植物照護系統。透過感測器偵測環境與土壤濕度，自動控制澆水，並利用 App 遠端監測與接收通知，讓使用者隨時掌握植物狀況，輕鬆實現智慧化照護。

（二）特色（居家智慧植栽篇）

- 智慧偵測與自動澆水：整合 DHT11、YL-69 感測器與水泵模組，自動判斷植物所需水分。
- 即時雲端同步：透過 Firebase 即時上傳環境數據與影像，手機 App 可查詢。
- 多模式灌溉：支援手動、定時與智慧模式，自由切換照護方式。
- 影音互動與語音助理：內建影音播放及語音辨識功能，供操作教學。
- 個人化照護建議：內建植物資料庫，依植物種類自動套用最佳生長條件。

（一）系統簡述（智慧居家安全篇）

《智慧居家安全篇》用樹莓派與影像辨識技術進行跌倒與起床偵測。跌倒透過 App 即時警示並閃爍 LED 提醒，起床則自動開燈並記錄於 App。適用於智慧家居安全監測，協助獨居長者與行動不便者在緊急狀況下獲得警報通知，降低意外風

險。

（二）特色（智慧居家安全篇）

- 即時偵測與回饋：自動辨識「起床」與「跌倒」事件，並透過燈號或警報即時回饋。
- 簡易操作介面：單頁設計、清晰按鈕，操作簡單直覺，長者也能輕鬆使用。
- 提升居家安全：適用於獨居長者與行動不便者，在緊急情況中即時發出警報，降低意外風險。

五、 Introduction：

Introduction (Smart Home Plant Care Edition)

The “Smart Home Plant Care Edition” is a plant care system that integrates IoT and smart appliance technologies. It detects environmental and soil humidity through sensors, automatically controls watering, and allows users to remotely monitor and receive notifications via the App, enabling convenient and intelligent plant management anytime.

Features (Smart Home Plant Care Edition)

- Smart Detection & Automatic Watering: Integrates DHT11 and YL-69 sensors with a water pump module to determine the plant’s water needs automatically.
- Real-time Cloud Synchronization: Uploads environmental data and images instantly to Firebase, viewable anytime through the mobile app.
- Multiple Watering Modes: Supports manual, scheduled, and smart watering modes for flexible plant management.
- Audio-Visual Interaction and Voice Assistant: Built-in media playback and speech recognition functions provide operation guidance.
- Personalized Plant Care Suggestions: Includes a plant database that adjusts optimal growth conditions for each plant type.
- Modular & Scalable Design: Supports future upgrades with AI image recognition and machine learning for enhanced intelligence and adaptability.

Introduction (Smart Home Safety Edition)

“Smart Home Safety Edition” utilizes Raspberry Pi and image recognition technology to detect fall and wake-up events. When a fall is detected, the system immediately alerts users through the App and flashes an LED light; when waking up, the light turns on automatically and the event is recorded in the App. It is designed for home safety monitoring, helping elderly or mobility-impaired individuals receive instant alerts during emergencies and reducing the risk of accidents.

Features (Smart Home Safety Edition)

- Real-time Detection and Feedback: Automatically detects Wake-up and Fall events, responding instantly with light or alarm alerts.
- User-Friendly Interface: One-screen layout with clear on/off controls, ensuring easy operation for all users, including the elderly.
- Enhanced Home Safety: Ideal for seniors or people with limited mobility, providing timely alerts during emergencies to reduce risks.