組別 **Team ID**：**202416**

專題屬性 **Catlegory**：**AIoT 應用（AIoT Applications）**

專題名稱 **Project**：**具智慧偵測超慢跑-LeisurePace**
（**Intelligent detection slow jogging -LeisurePace**）

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三、 系統環境 **System environment**：

（一）軟體 Software：

作業系統 Operating System: Windows 11、macOS 14.4

語言 Programing language:Python、JavaScript、HTML、CSS、Swift、Kotlin

開發工具 Toolkits: Xcode、Visual Studio Code、Android Studio、MediaPipe、OpenCV、Jupyter Notebook、Firebase (資料庫)

（二）硬體 Hardware：

CPU:Intel(R) Core(TM)i5-10210U CPU @ 1.6GHz 或更高規格；硬碟:475G；記憶體:8G RAM；顯示器:17 以上。

四、 簡介：

（一）系統簡述（系統的主要功能）

本系統的主要功能為 LeisurePace 超慢跑用戶提供即時的姿勢偵測與校正，減少因運動姿勢不當所引發的傷害風險，提升運動的安全性和有效性。該功能利用先進的 MediaPipe 技術，精確捕捉用戶身體的 22 個關鍵節點，並通過運算與分析技術，將偵測結果即時顯示於螢幕上，方便用戶隨時檢查自己的姿勢。

系統會根據用戶的動作變化進行即時提醒，協助用戶在運動過程中進行姿勢調整，從而降低運動風險並提升運動體驗。此功能特別適合那些對姿勢有較高要求的運動者，幫助他們在日常運動中保持正確姿勢，避免長期運動可能導致的慢性傷害。透過智慧偵測與提醒機制，本系統期望成為用戶的安全運動伴侶，為用戶帶來更健康、更舒適的超慢跑體驗。

（二）特色（系統的亮點）

● 腳步偵測功能: 為了方便使用者在超慢跑時能計步設計了腳步偵測功能,結合 OpenCV 使用者的電腦或手機攝像頭來偵測使用者腳步的活動軌跡並且利用 Mediapipe 掌握使用者的身體節點來準確計算每一步超慢跑步數。

● 姿勢糾正功能:AI 姿勢糾正功能,協助使用者能夠順利完成超慢跑運動,並防止肌肉拉傷或其他運動傷害,幫助使用者暖身與糾正運動傷害等問題。

● 與畫家合作: 介紹台灣本土畫家何木火大師的畫作，說出每幅畫的意義讓所有使用者能認識台灣本土畫家何木火的作畫風格與畫作背後的含義。

五、 Introduction：

(一) Introduction

The primary function of this system is to provide LeisurePace slow jogging users with real-time posture detection and correction, reducing the risk of injury due to improper form and enhancing the safety and effectiveness of their exercise. This feature leverages advanced MediaPipe technology to accurately capture 22 key body points, and through computational analysis, it displays the detection results in real time on the screen, allowing users to monitor their posture continuously.

The system provides instant alerts based on the user's movements, assisting them in adjusting their posture during exercise to reduce risks and improve their experience. This feature is especially suited for athletes who require precise posture, helping them maintain proper form during daily activities to avoid chronic injuries from prolonged exercise. Through intelligent detection and alert mechanisms, this system aims to be a safe exercise companion, offering users a healthier and more comfortable slow jogging experience.

(二) Features

● Step Detection Feature: To help users keep track of their steps during slow jogging, this system includes a step detection feature. By integrating OpenCV, the system uses the computer or mobile camera to detect the user's foot movement trajectory. Additionally, MediaPipe is employed to monitor body landmarks, enabling precise calculation of each slow jogging step.

● Posture Correction Feature: The AI-based posture correction feature assists users in completing slow jogging exercises safely and effectively. It helps prevent muscle strains and other exercise-related injuries, providing support for warming up and addressing posture-related issues to reduce the risk of injuries.

● Collaborating with Artists: Introduce the works of Taiwanese local artist Master Ho Mu-huo, explaining the meaning behind each painting to help all users appreciate his unique style and the stories behind his artwork.