科技部人文社會科學研究中心

跨領域整合型研究計畫之前置規劃案成果報告

健身消費者焦點訪談分析及建立健身房智慧運動裝置生物力學模型數據庫

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摘要

本跨領域整合型研究計畫目的為建立運動訓練動作平衡監測生物力學模組，包括運動訓練動作平衡的重心位置所對應的足底壓力及運動學特徵，藉以分析個體之多因子交互作用結果數據，擬定出人體對應之生物力學常模指標，進而作為運動訓練動作平衡評估依據，將所搜集到之資訊分析後，而回饋給予使用者運動訓練動作建議資料。

本計畫依循目前全球運動裝備智慧化發展之趨勢，藉由生物訊號監測運動過程，進行即時回饋修正，以解決一般初學者進行運動訓練過程中，因無法及時提供足夠正確姿勢訊息所產生運動傷害之問題。

藉由本計畫整合成熟技術，加速高端運動生物訊號感測設備商用化，可落實輔助專業教練教學，提供客製化課程指導及成效追蹤，進而達到能提供個人量化運動處方以提高訓練品質。

經由此跨領域整合型研究計畫規劃案，討論結果未來跨領域整合型研究計畫執行將分為三個子計畫部分，第 1 部分為健身消費者焦點訪談分析，第 2 部分為整合 Kinect 攝影機及足底壓力量測系統為基礎的運動訓練動作平衡分析軟硬體系統，第 3 部分為運動健身訓練動作平衡之生物力學模型數據庫建立與分析。

關鍵詞：裝戴穿置、足底壓力、平衡、動作分析

Abstract

The purpose of this cross-domain integrated research program is to establish a biomechanical module for sports training including the foot pressure and kinematic characteristics of the center of gravity of the balance of motion. The module will be used to analyze the results of multiple factors and develop the corresponding biomechanical norm of human body. The norm will be then used as a basis for the assessment of movement and balance. The analyzed information will give feedback to users for the training recommendations.

The program follows the current trend of the development of intelligent sports equipment. There will be a biological monitoring process and immediate feedback correction to solve the issue of general beginners who cannot get enough correct posture information.

The program can integrate mature technologies to accelerate the commercialization of the sensors. The integrated sensors can aid professional instructors teaching, providing customized course guidance and tracking performances, so as to provide personal quantitative prescription of exercises to improve the training quality.

The execution of the cross-domain integrated research program will be divided into three sub-program parts through this planning. Part 1 is the focus of interviews for fitness consumers. Part 2 is the integration of the hardware and software based on the Kinect camera and foot pressure measurement system for the movement and balance analysis of exercise. Part 3 is the establishment of biomechanical database for fitness balance raining and movement analysis

Key words: wearable gear, foot pressure, balance, movement analysis