

研發結合生程式AI及眼球追蹤系統應用於評估病患復健成效及協助溝通

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摘要

隨著智慧科技的發展，擴增實境(AR) 和虛擬實境(VR) 在醫療領域的應用愈發廣泛。這些技術依賴穿戴式裝置，如智慧眼鏡，已廣泛應用於病患復健。然而，由於中老年患者表達能力及認知功能可能受限(如老年失智、認知缺損、阿茲海默症等)，對於需要復健的病患，尤其是重症或使用呼吸器的患者，與醫護人員的雙向溝通常面臨挑戰。智慧眼鏡整合了眼動追蹤系統，可用於評估病患的眼動功能，甚至能用於幫助溝通。

此研究計劃使用J7EF 智慧眼鏡，配備Qualcomm Snapdragon XR 平台、眼球攝像機和紅外照明器，透過追蹤眼球移動、注視位置、處理速度及瞳孔變化等數據，來評估病患術後恢復情況和協助溝通。此外，延伸結合AR技術和個性化復健APP' 病患可接受量身定制的心肺及肢體運動訓練，同時智慧手錶監測心率和血氧等數據以評估復健強度。此系統特別適用於言語或書寫能力受限的病患，提供更方便的溝通方式。生成式AI 將分析收集到的數據，提供精準的反饋。此計劃預計將對於臨床應用和提升醫療服務質量均會有重要貢獻。

關鍵詞:智慧餐具、無人自動行走車、醫院餐飲服務

Abstract

With the development of smart technology, augmented reality (AR) and virtual reality (VR) are increasingly used in the medical field. These technologies rely on wearable devices, such as smart glasses, which have been widely used in patient rehabilitation. However, since middle-aged and elderly patients may have limited expressive abilities and cognitive functions (such as senile dementia, cognitive impairment, Alzheimer's disease, etc.), patients who require rehabilitation, especially those who are seriously ill or who use respirators, two-way communication with medical staff often faces challenges. Smart glasses incorporate an eye-tracking system that can be used to assess a patient's eye movement function and even help with communication.

This research plan uses J7EF smart glasses, equipped with Qualcomm Snapdragon XR platform, eyeball cameras and infrared illuminators, to evaluate patients' postoperative recovery and assist communication by tracking data such as eye movement, gaze position, processing speed and pupil changes. In addition, by extending the combination of AR technology and personalized rehabilitation APP, patients can receive customized cardiopulmonary and limb exercise training, while the smart watch monitors data such as heart rate and blood oxygen to evaluate the intensity of rehabilitation. This system is particularly suitable for patients with limited speech or writing abilities, providing a more convenient way to communicate. Generative AI will analyze the collected data and provide accurate feedback. This project is expected to make important contributions to clinical applications and improving the quality of medical services.

Keywords: Eye tracking system, wearable device, assessment of rehabilitation intensity, accurate communication