THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

為職業治療中的自理訓練而開發的觸感仿真平台

Haptic Platform for Self-care Training in Occupational Therapy

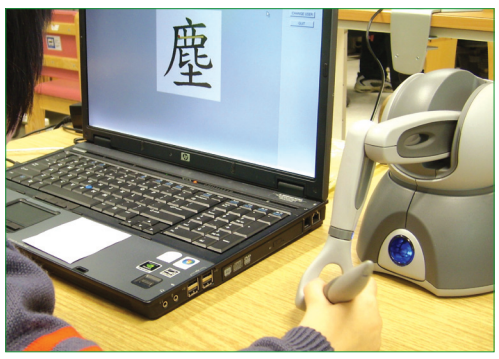
利用虛擬實境和電腦遊戲技術來加強有身體障礙人士的自理培訓

Using virtual reality and computer gaming technology to facilitate self-care training for the physically disabled

手部功能障礙令傷殘人士難以照顧自己。已沿用多年的傳統自理培訓大多採用實物訓練學員，但卻存在著安全性、效率和成本效益等方面的潛在問題。目前採用體感遊戲機技術的電腦化康復訓練系統如能配上觸覺反饋功能，應該有助解決上述難題，然而市面上還未有這樣的系統。因此，理大利用虛擬實境技術開發了一個多功能且備有觸感仿真平台，讓接受自理訓練的學員可以感受到力覺反饋。目前，透過此平台進行的訓練包括用鑰匙開門、把水倒進玻璃杯和寫字等日常生活的活動。此平台的應用範疇可進一步擴展到其他方面，如職業康復訓練等。

適用於自理培訓的觸感仿真平台的原型
The prototype of the haptic platform implemented for self-care training

兒童在治療師的指導下進行虛擬開門訓練
A kid receiving virtual door opening training under the guidance of a therapist



用來進行寫字訓練的觸感仿真平台
The haptic platform implemented for handwriting training

特色與優點

- 在模擬仿真實境中進行手部活動、手眼協調及靈巧度的訓練
- 提供力覺反饋，以增強訓練的真實感和提高學習效能
- 沒有風險，操作簡便，無需使用實物材料即可反覆進行練習
- 使用定量指標來客觀評估訓練效能
- 容易作出改動及增加功能，以配合各類職業治療訓練活動

應　用

- 此觸感仿真平台適用於在職業治療中的自理培訓，如開門、寫字或繪圖，以及準備食物
- 可以很容易地把這平台改為職業康復訓練系統，或其他訓練手部活動及靈巧度的系統

獎　項

- 2012香港資訊及通訊科技獎 - 最佳創新及研究：特別嘉許(社會責任)
- 2013香港創意日（醫療及健康護理）中獲得：亞軍
- 第42屆瑞士日內瓦國際發明展 - 銀獎 (2014年4月)
- 國家知識產權局中國專利信息中心代表團特別獎 (2014年4月)

Hand impairment induces difficulties for disabled people to take care of themselves. While conventional self-care training performed in settings with real materials has been used for many years, potential problems related to safety, efficiency and cost exist. Computerised training using motion sensing game consoles with tactile perception is a possible solution but is not yet available. A versatile virtual-reality haptic platform which provides force sensation in self-care training has been successfully developed by PolyU. Daily life activities, such as opening a door with a key, pouring water into a glass and handwriting, have already been implemented on the platform. It can be further extended to other applications such as vocational rehabilitation.

Special Features and Advantages

- Training of hand movement, hand-eye coordination and dexterity in cyber space
- Force feedback available to enhance realism and improve learning performance
- Risk-free, convenient and repetitive practice without physical training materials
- Objective performance assessment using quantitative metrics.
- Readily extensible and adaptable for various tasks in occupational therapy

Applications

- The platform can be used for self-care training in occupational therapy, e.g. door opening, handwriting, drawing and food preparation.
- It can be easily adapted for vocational rehabilitation or other training concerning hand movement and dexterity

Awards

- Hong Kong ICT Awards 2012 – Best Innovation & Research (Postgraduates & Open) Award – Special Mention (Social Responsibility)
- Innovation Award of Hong Kong Innovation Day - First Runner Up
- Silver Medal - 42nd International Exhibition of Inventions of Geneva, Switzerland (April 2014)
- Special Merit Award from China Patent Information Center of SIPO (April 2014)

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