

基於 MindWave 之虛擬實境遊戲減輕動暈症之研究

Research on virtual reality gamebased on mindwave to reduce motion sickness

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摘要

在進行虛擬實境遊戲中，人物的移動導致使用者眼中景物的運動與人體前庭系統感覺到的運動不相符時會產生動暈症狀態，考慮到遊戲遊玩中設備的便攜性與 VR 顯示器的佩戴方式，本研究使用 NeuroSky 的 MindWave Mobile 檢測腦電圖數據，在 Unreal Engine 4 (UE4) 中使用車輛駕駛模擬器，並使用視覺化語言 Blueprints 設計一組程式能自動尋找使用者的正常腦波範圍，在腦波數值超出正常範圍一段時間後啟用物理降速功能，當功能啟動時減少人物移動時產生的運動不相符狀態以減輕動暈症的發生等級，研究結果發現在啟用物理降速功能後，多數受試者的主觀動暈症等級皆有下降。

關鍵字：虛擬實境、MindWave、腦電圖、UE4、動暈症

Abstract

In the virtual reality game, the movement of the character causes the motion of the scene in the user's eye to be inconsistent with the motion perceived by the human vestibular system, which may cause a state of motion disorder, considering the portability of the device in the game play and the wearing of the VR display. In this way, this study uses NeuroSky's MindWave Mobile to detect EEG data, use the vehicle driving simulator in Unreal Engine 4(UE4), and use the visual language Blueprints to design a set of programs that automatically find the user's normal brainwave range in the brainwaves. When the value exceeds the normal range for a period of time, the physical slowdown function is enabled, and when the function is activated, the motion inconsistency generated when the character moves is reduced to reduce the occurrence level of the motion sickness. The study found that after the physical slowdown function was enabled, the subjective motion sickness level of most subjects decreased.

Keywords: virtual reality, MindWave, EEG, UE4, motion sickness