無人騎乘自行車系統設計與穩定行駛控制之研究

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摘 要

本論文主旨在發展無人自行車平穩控制系統的設計與實現技術。首先建立自行車動態資料量測系統，其包含的元件有側傾角感知器、編碼器等，對自行車的側傾角、前叉轉向角度、車速等進行量測。無人自行車控制系統是以工業電腦作為控制器的平台，使用模糊控制理論作為控制器的主要核心，對自行車進行轉向控制。設計以伺服馬達作為驅動器的轉向控制機構，用來模擬騎士騎乘操控狀態，並於控制器加入自行車速度與加速度之控制影響。最後進行無人自行車操控實驗，本論文中所使用的資料擷取程式與控制法則程式，皆使用虛擬儀控軟體LabVIEW所撰寫，在實驗上所得到之數據，可以驗證本論文所設計的系統與控制器的可行性。

關鍵詞 : 無人自行車 ; 模糊控制 ; 工業電腦

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