線傳智慧型車輛驅動與操控動態模擬及控制之研究

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摘 要

本研究旨在建立線傳智慧型車輛驅動與操控動態模擬及控制 系統，藉由控制輪內馬達驅動、輪內馬達制動及車輛轉向，使車 輛在行駛中駕駛者處於安全狀態。當車輛直線行駛時採取滑移率 控制，使車輛在直線行駛加速情況下，車輪不至產生打滑情況， 以確保車輛穩定直線行駛。車輛轉彎時，由當時車速、車身橫擺 率及車輛滑移角計算出各輪內馬達獨立之輪轉速以控制轉彎差 速，避免輪胎產生不正常磨耗及車輛不穩定之現象。 本研究採用的控制策略包括循跡控制、主動式轉向控制、輪 內馬達扭力控制及適應性四輪轉向控制等，使車輛不論在直行或 過彎時皆能快速及安全行駛。其中主動式轉向控制包含前後輪轉 向比值隨車速變化、轉向減速比隨車速變化使車身橫擺率、車身 側加速度、車身滑移角為最佳操控性能輸出。本項計畫研究可整 合機械、車輛與電腦資訊、控制、通訊等相關產業與學界研究單 位之能量，評估分析所須之性能，同時協助工程師改善設計、縮 短研發試誤及時辰，提升國內自主車輛線傳即時四輪轉向及車體 穩定控制系統研發設計能力，與世界先進技術聯結，開拓未來車 用電子商機

關鍵詞 : 線傳智慧型車輛、線傳車輛驅動與操控動態模擬及控制 系統、動態硬體迴路模擬

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