線傳煞車系統之車輛動態穩定控制系統之研究與實驗

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摘 要

本研究使用新型線傳煞車系統與自行開發的車輛穩態控制系統做連結，並利用CARSIM RT設定出與實驗車相彷的車輛運動數學模型。 在硬體模擬迴路模擬實驗中，本研究首先透過CARSIM RT計算出車輛運動數學模型的各項行車資料至吾人建立之VDC控制器後，產生出對應之煞車作動器閥門的控制訊號，透過CAN BUS將該訊號傳送至線傳煞車試驗平台後，使線傳煞車試驗平台進行四輪獨立油壓控制，並將控制後之油壓訊號透過CAN BUS傳送至CARSIM RT，以模擬煞車控制後之行車資訊，進而探討車輛在失控狀態下，輪胎作用力對車體動態之影響。 在控制器建立的部份，本研究以CARSIM之車輛數學模型為控制對象，透過Simulink建立－用來控制四輪煞車油壓之控制器，並利用基因演算法針對各個路況與操控方式找出模糊控制器參數的最適化設定。本文先利用CARSIM將VDC控制器架構建構出來，當VDC控制器設定好之後與CARSIM RT、SBC煞車系統做硬體迴路模擬以驗證VDC控制器的可靠與穩定度。

關鍵詞 : 煞車控制器 ; 模糊控制 ; 車輛動態穩定控制 ; 硬體模擬迴路

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