雙動力驅動車輛之電控系統研發

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摘 要

近年來國際油價仍然持續在高檔居高不下，溫室效應引發的全球氣象異變，嚴重影響許多國家的經濟建設發展與人民生命財產安全，在能源危機及環保意識抬頭等雙重現實下，給予複合動力技術萌芽的背景。自 1997 年豐田汽車（Toyota）在日本推出 Prius 這台運用汽油及電力驅動車輛的複合電動車之後，這類複合電動車具有低污染及省油等特性，有機會在未來成為汽車科技的主流。

有鑑於多動力驅動車輛日益重要，本論文發展一種雙動力驅動車輛的電控系統驅動器與控制器研發，其中包含直流無刷馬達驅動器、磷酸鋰鐵電池充電驅動器、發電機及主控制器管理系統。在電控系統中，使用高性能的德州儀器數位訊號處理器（DSP）作為各控制器之間的訊號溝通與處理各系統的運作。

本論文將此電控系統應用於一並聯式複合動力驅動系統，配合能量管理策略，控制車輛在各種路面及負載狀況下運轉。此研究中也順利完成實驗平台的建構，藉由實驗平台的系統零組件配置及行車模式的測試操控，以及實測之結果驗證此電控系統與能量管理策略之動力整合功能與成效。

關鍵詞 : 複合電動車、直流無刷馬達、磷酸鋰鐵電池、數位訊號處理器、能量管理策略

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