Electrical Control System and Li-ion Battery Management System of Parallel Hybrid Electric Heavy Motorcycle

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ABSTRACT

In a world where environment protection and energy conservation are growing concerns, the development of hybrid electric vehicles (HEV) has taken on an accelerated pace. We put our attention on the development and research of hybrid electric heavy motorcycle since it is much more widespread than HEV for individual transportation in Taiwan. Electrical control system in the thesis is mainly focused on the new parallel hybrid system; among them include car's using the instant battery charger, Li-ion battery management system (combined SMBus) and electrical control system main controller (combined DSP). In the motor control, by using the totally invariant variable structure system and linear matrix inequality theory, we design a modified output feedback controller. The controller using only output variable is proposed to stabilize the mismatched uncertainty system robustly that mismatched variable structure systems is asymptotically stable with good performance.

Keywords : Hybrid electric heavy motorcycle ; Real time battery charger ; Li-ion battery management system ; System management bus (SMBus) ; Motor control ; Digital signal processor (DSP) ; Variable structure system

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