THE CONTROL AND IMPLEMENTATION OF A PARALLEL HYBRID MOTORCYCLE

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ABSTRACT

This thesis primarily studies the system architecture of hybrid motorcycle. Based on the motor of a commercial electrical motorcycle and a 50cc internal combustion engine, we build a parallel hybrid system at a platform. The electronic control unit (ECU) is used to integrate hybrid power system. The development of ECU is on the control algorithm design, the control strategy improvement and parameters justification. We carry out a series of tests respectively on the engine system, motor system, generator system and power split system to understand the power and the performance of individual systems. The rotational speed and torque of each component are also measured. We use three different types of power inputs: power only from motor system, power only from engine system and hybrid power from the two systems. Different test combinations, such as the motor driver inputs, the engine speed commands and theirs order the two inputs, are tested in the experiments. Through the power distribution of the power split and data measured from the sensors, we investigate the power transform efficiency and energy conversion between systems. Keywords: Parallel Hybrid Motorcycle, Hybrid System, Power Split, ECU.

Keywords : Parallel Hybrid Motorcycle ; Hybrid System ; Power Split ; ECU

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