

Control and Integration of a PEMFC Motorcycle

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Abstract

This paper demonstrates a hybrid fuel-cell motorcycle that is composed of a proton exchange membrane fuel cell (PEMFC) system and two lithium-ion battery sets. The study is carried out by three steps. First, we model the PEMFC and design a robust controller to improve the system's performance and efficiency. Second, we design a serial power-train to connect the PEMFC system and two secondary battery sets, and develop suitable power management strategies for continuous operation of the motorcycle. Lastly, the aforementioned two subsystems are integrated for experiment verification. Based on the results, the proposed PEMFC motorbike is deemed effective. Keywords: PEMFC, fuel cell, robust control, power management, electric motorcycle.