

## **Robust Converter Control Design for a Hybrid PEMFC System**

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### **Abstract**

The applications of fuel cell are increasing important, especially in the fields of electric vehicles and stationary electricity systems, due to the shortage of fossil fuel. But because the output of the fuel cell is influenced by loads, it is difficult to control the fuel-cell output current. In this article, we develop a method for current control and integrate it with a stationary power system that consists of a 3kW proton exchange membrane fuel cell (PEMFC), a DC/DC converter, and LiFePO<sub>4</sub> Battery set. We identify and control the DC/DC converter to adjust the PEMFC power and the battery SOC. Then we conduct experiments and show that the designed controller can regulate the output current for different loads, and integrate the hybrid PEMFC system for analyses and optimization.