

**Proton Exchange Membrane Fuel Cell System Identification and Control: Part II: H-infinity based Robust Control**

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**Abstract**

This paper applies robust control strategies to a PEM fuel-cell system. In Part I of this work [17], a PEM fuel cell was described as a two-input-two-output system with the inputs of hydrogen and air flow rates, and the outputs of cell voltage and current. From the responses, system identification techniques were adopted to model the system transfer function matrix. Then adaptive control methods were applied to control the system with encouraging results. In this paper, the  $H_\infty$  robust control strategy is proposed due to the highly nonlinear and time-varying characteristics of the system. From the results, it is illustrated to be an efficient control method for the fuel cell systems.