

## Article Abstract

Title:	Model-based fault detection for proton exchange membrane fuel cell systems
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Abstract:	In this paper, an intelligent model-based fault detection (FD) is developed for proton exchange membrane fuel cell (PEMFC) dynamic systems using an independent radial basis function (RBF) networks. The novelty is that this RBF networks is used to model the PEMFC dynamic systems and residuals are generated based on the differences between the PEMFC systems and RBF networks model. Later, based on this information the RBF model performed the FD including identification and classification. Five types of faults have been introduced to the PEMFC dynamic systems which occurred in the actuator, component and three sensors part. By considering the faults in the PEMFC systems is 10% changes in each component, the efficiency of the proposed model is studied. The developed model is tested on MATLAB/Simulink simulation. The results show that all the simulated faults can clearly be detected and classified by this intelligent model-based FD. By using this intelligent FD method, the PEMFC dynamic systems is intelligent to detect the faults quickly, classify them and then appropriate action can be taken immediately.
Keywords:	Proton Exchange Membrane Fuel Cell, model-based, RBF networks, fault detection, MATLAB/Simulink