Multi-objective Controller Performance for a Fuel Cell Turbine Hybrid Power System

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Abstract

Energy consumption remains at an all-time high, urging state of the art advancement in power systems. Direct fired fuel cell turbine hybrid power systems are a response to the high energy demand that offer fast start up times and an increase in power generation efficiency. However, poor system models, high nonlinearities, and extreme coupling between system parameters often render traditional control strategies inadequate at effectively controlling hybrid configurations. Learning-based control methods are used to alleviate these problems. Controllers trained with neuroevolution are currently being tuned to provide accurate and efficient control of Hyper, a cyber physical simulation of a hybrid power system. These controllers still need to be demonstrated to be effective under real world constraints. To this end, I show the controller's robustness to noise and its ability to adapt to changes in performance profiles.

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