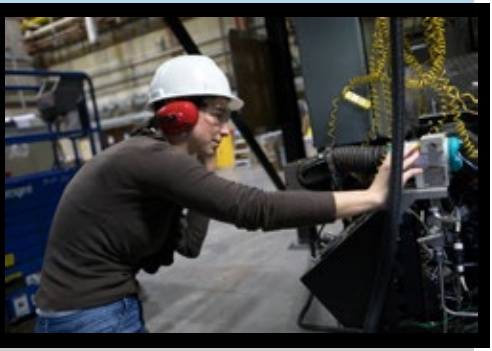
Agent-based Control Algorithm for Energy Systems

In advanced power systems the response of multiple sensors needs to be combined to provide better decisions and improved control strategies. The main challenge of this project is to design multiple computational agents that improve the coordination between control actions in tightly coupled advanced energy systems.

The multi-agent control approach in computational science builds intelligence into the decision-making process of complex systems. For this project we designed computational agents and made them intelligent by defining sets of rules and objective functions to control the dynamic response of a 100 kW laboratory scale gas turbine power system. Currently, the response of a single process variable can be controlled through the coordination of two computational agents that determine the suitable control action to the actuators.



The agent-based concept developed in this work will be extended for supervisory applications, such as to improve coordination in power management between microgrid systems to support load management during grid instabilities, blackouts, or equipment failures.

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