Holonic Multi-Agent Control of Intelligent Power Distribution Systems

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Abstract: The project demonstrates a holonic multi-agent system (HMAS) architecture capable of adaptively controlling future electrical power distribution systems, which are expected to include a large number of renewable power generators, energy storage devices, and advanced metering and control devices. The project provides a general, extensible, and secure cyber architecture based on holonic multi-agent principles to support adaptive PDS. It will produce new analytical insights to quantify the impact of information delay, quality and flow on the design and analysis of the PDS architecture. The architecture will be capable of optimizing performance and maintaining the system within operating limits during normal and minor events, such as cloud cover that reduces solar panels output. The architecture will also allow the operation of a distribution system as an island in emergencies, such as hurricanes/earthquakes, grid failures, or terrorist acts.

Project Team

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Intelligent Power Distribution Systems

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