

Fuzzy control of hybrid energy storage system

What is a hybrid energy storage system?

The proposed hybrid energy storage system of the HEV in this work consists of two energy sources: (1) main source: fuel cell and (2) auxiliary source: ultra-capacitor and battery. Furthermore, a fuzzy logic-based nonlinear controller has been developed to effectively control the management of energy sources according to load demand.

What is centralized control scheme for a hybrid power system?

Centralized control scheme is proposed for frequency control of a hybrid power system. Fractional order fuzzy PID controller outperforms the PID and fuzzy PID structures. Controllers are tuned with chaotic map adapted particle swarm optimization. Stochastic variation in load and renewable generation are considered for simulation.

Can a centralized control scheme suppress grid frequency oscillation in a hybrid power system?

Conclusions This paper proposes a centralized control scheme with a novel fractional order fuzzy PID controller for suppressing the grid frequency oscillation in a hybrid power system. The centralized scheme offers the advantage of cost effectiveness, reduced maintenance, wiring and number of parameters to tune.

What is a fuzzy control strategy?

This paper uses a fuzzy control strategy, based on the actual operating conditions of the ship, except that the ship's power fluctuation is very small; the SC will provide energy for the ship to make full use of the SC instead of waiting for the arrival of high-power fluctuations.

What is fuzzy control scheme?

The fuzzy control scheme is implemented in such a way that it allows power transfer from primary and secondary energy sources towards the load and also from load towards the source. The basic block diagram of the fuzzy-based controller is shown in Fig. 4.

What is a hybrid power system?

The hybrid power system employs various autonomous generation systems like wind turbine, solar photovoltaic, diesel engine, fuel-cell, aqua electrolyzer etc. Other energy storage devices like the battery, flywheel and ultra-capacitor are also present in the network.

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Active Hybrid Energy Storage System (HESS) topology used in this study. 2. Hybrid Energy Storage System The overall system design is depicted in Figure 2. From this figure it is clear ...



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