Fuzzy Control of Microgrid Economic Optimization

Is a microgrid system optimized by fuzzy logic control and proportional-integral controller?

This research proposes a comparative analysis of an autonomous microgrid systemoptimized by fuzzy logic control and proportional-integral controller. The microgrid fuzzy logic control parameters are designed using the African vulture and Particle swarm optimization algorithms.

What optimization techniques are used in microgrid energy management systems?

Review of optimization techniques used in microgrid energy management systems. Mixed integer linear programis the most used optimization technique. Multi-agent systems are most ideal for solving unit commitment and demand management. State-of-the-art machine learning algorithms are used for forecasting applications.

Do microgrids need an optimal energy management technique?

Therefore,an optimal energy management technique is requiredto achieve a high level of system reliability and operational efficiency. A state-of-the-art systematic review of the different optimization techniques used to address the energy management problems in microgrids is presented in this article.

How to control AC micro-grid?

control in AC micro-grid. The first technique is based on PID controller. The co ntroller provides a very good stab ilization management, and optimization of energy using the battery. connects between the battery and DC_Bus. Th e second and high performance of the e nergy management. In the t hird different meteorology conditions.

How are microgrid control parameters designed?

The microgrid fuzzy logic control parameters are designed using the African vulture and Particle swarm optimization algorithms. At the same time,the proportional-integral controller is designed by using the Gorilla troops optimization algorithm. The suggested microgrid control techniques are verified using a MATLAB/Simulink environment.

Can a fuzzy controller based EMS control a dc microgrid system?

Chen et al. proposed a fuzzy controller based EMS using LabVIEW to control and monitor a DC microgrid system . Improving the life cycle of the battery based on the desired SoC was one of the main objectives of the proposed EMS, which also used RS-485/ZigBee network communication interface in real-time implementation of the system.

A typical microgrid consists of a wind turbine (WT), a photo voltaic (PV), a storage battery (SB), a microturbine (MT), and a fuel cell (FC); the thermal and electric loads are ...

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Control of a hybrid microgrid using a fuzzy logic controller: ... Techno-economic optimization of hybrid photovoltaic/wind generation together with energy storage system in a ...

In order to better to improve the economics of the microgrid, this paper proposes a Q-learning algorithm based on fuzzy control. It is a model-free algorithm, without complicated modelling, ...

This study introduces a microgrid system, an overview of local control in Microgrid, and an efficient EMS for effective microgrid operations using three smart controllers for optimal microgrid ...

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The first part comprises three chapters and is devoted to fuzzy modeling and local control of microgrid converters. Part II covers centralized, decentralized, and distributed ...

The fuzzy control is implemented to maintain a decentralized power distribution between the microgrid DC-link and ESU. The PV coupled to the DC microgrid of the charging station is variable in nature.

4 ???· Aiming at the frequency instability caused by insufficient energy in microgrids and the low willingness of grid source and load storage to participate in optimization, a microgrid ...

This paper presents an overview for researchers on economic model predictive control (EMPC) methods of microgrids to achieve a variety of objectives such as cost minimization and benefit ...

Specifically, CSASCA achieves optimal values of 590.45 EURct for cost and 337.28 kg for emissions in the first scenario, 98.203 EURct for cost and 406.204 kg for emissions in the ...

An alternative method, called T-S fuzzy strategy, can guarantee global stability and approximate nonlinear systems well (Hu et al., 2022), which makes it interesting to explore a fuzzy control ...

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