

Currently there is many studies based on microgrid system optimization that involves either hybrid RES sources or HESS with the aim of reducing the operation cost of the system. ... Enriching the stability of solar/wind DC microgrids using battery and superconducting magnetic energy storage based fuzzy logic control. Journal of Energy Storage ...

optimized fuzzy logic control-based EMS for a microgrid with a fuel cell system (FC), photovoltaic array (PV), electrolyser, and battery bank. The main objective of the designed EMS is to ...

A microgrid (MG) is an independent energy system catering to a specific area, such as a college campus, hospital complex, business center, or neighbourhood (Alsharif, 2017a, Venkatesan et al., 2021a) relies on various distributed energy sources like solar panels, wind turbines, combined heat and power, and generators (AlQaisy et al., 2022, Alsharif, 2017b, Venkatesan et al., ...

The integration of renewable energy resources into the smart grids improves the system resilience, provide sustainable demand-generation balance, and produces clean ...

Serban [61] designed an original hardware-in-the loop (HIL) solution for real-time testing and optimization of the frequency control mechanism in autonomous microgrids, where battery energy storage systems (BESS) were integrated along with classical RES generators.

The grid integration of microgrids and the selection of energy management systems (EMS) based on robustness and energy efficiency in terms of generation, storage, and distribution are becoming ...

Improving direct current microgrid (DC-MG) performance is achieved through the implementation in conjunction with a hybrid energy storage system (HESS).The microgrid's operation is optimized by fuzzy logic, which boosts stability and efficiency. By combining many storage technologies, the hybrid energy storage system offers dependable and adaptable ...

We design the Microgrid, which is made up of renewable solar generators and wind sources, Li-ion battery storage system, backup electrical grids, and AC/DC loads, taking into account all of the ...

This paper presents a microgrid energy management system that encompasses a combination of solar panels with maximum power point tracking (MPPT), a battery storage unit connected by a ...

This research paper presents a new approach to address power quality concerns in microgrids (MGs) by employing a superconducting fault current limiter (SFCL) and a fuzzy-based inverter. The integration of

multiple power electronics converters in a microgrid typically increases total harmonic distortion (THD), which in turn results in power quality ...

In the optimization of microgrid, energy storage system can improve the quality of power grid, and has gradually become an indispensable part of microgrid [16]. Islam pro-posed a FLC-based battery energy storage control system, which reduces power grid fluctuations only by controlling battery charging and discharging, eliminates the necessity

In recent years, renewable energy has seen widespread application. However, due to its intermittent nature, there is a need to develop energy management systems for its scheduling and control. This paper introduces a multi-stage constraint-handling multi-objective optimization method tailored for resilient microgrid energy management. The microgrid ...

The obtained results show that the performance of the optimized controller for energy storage-based microgrid successfully reduced the amount of power consumption which ...

Since fuzzy logic control (FLC) has proven to be a powerful tool for dealing with the nonlinearities of a microgrid and the application of fuzzy-based EMS for isolated microgrids is rarely reported in the literature, this study proposes the application of an FLC for the EMS's design of an isolated microgrid.

At present, renewable energy sources (RESs) and electric vehicles (EVs) are presented as viable solutions to reduce operation costs and lessen the negative environmental effects of microgrids (mGs). Thus, the rising demand for EV charging and storage systems coupled with the growing penetration of various RESs has generated new obstacles to the ...

The rapid development of the global economy has led to a notable surge in energy demand. Due to the increasing greenhouse gas emissions, the global warming becomes one of humanity's paramount challenges [1].The primary methods for decreasing emissions associated with energy production include the utilization of renewable energy sources (RESs) ...

In the study conducted earlier [11], an energy management system (EMS) based on fuzzy logic was implemented for a grid-connected residential direct current microgrid (DC-MG) featuring hybrid energy ...

Microgrids play a crucial role in modern energy systems by integrating diverse energy sources and enhancing grid resilience. This study addresses the optimization of microgrids through the ...

A microgrid consists of distributed generations (DGs) such as renewable energy sources (RESs) and energy storage systems within a specific local area near the loads, categorized into AC, DC, and hybrid microgrids [1].The DC nature of most RESs as well as most loads, and fewer power quality concerns increased attention to the DC microgrid [2].Also, ...

K e y w o r d s: Fuzzy gain scheduling PI, Improved grey wolf optimization; Microgrid, Fuzzy logic controller, Hybrid energy storage systems **P o s t e d D a t e :** December 19th, 2023

A hydrogen fuel station is an infrastructure for commercializing hydrogen energy using fuel cells, especially in the automotive field. Hydrogen, produced through microgrid systems of renewable energy sources such as solar and wind, is a green fuel that can greatly reduce the use of fossil fuels in the transportation sector.

Microgrids, comprising distributed generation, energy storage systems, and loads, have recently piqued users' interest as a potentially viable renewable energy solution for combating climate change. According to the upstream electricity grid conditions, microgrid can operate in grid-connected and islanded modes. Energy storage systems play a critical role in ...

Shared energy storage offers investors in energy storage not only financial advantages [10], but it also helps new energy become more popular [11]. A shared energy storage optimization configuration model for a multi-regional integrated energy system, for instance, is built by the literature [5]. When compared to a single microgrid operating ...

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In [13, 14], PV-battery energy storage system (BESS) is proposed and optimized using linear programming, but it did ... a fuzzy logic-based VSG has been proposed where the parameters are updated using change in ... Abbreviations: BFOA, bacteria foraging optimization algorithm; HESS, hybrid energy storage system; LQR, linear-quadratic regulator ...

A multi-objective optimization solution for distributed generation energy management in microgrids with hybrid energy sources and battery storage system. J. Energy Storage 75, 109702.

Electronics, 2020. This paper proposes a fuzzy logic-based energy management system (EMS) for microgrids with a combined battery and hydrogen energy storage system (ESS), which ensures the power balance according to the load demand at the time that it takes into account the improvement of the microgrid performance from a technical and economic point of view.

Fuzzy logic-based particle swarm optimization for integrated energy management system considering battery storage degradation. ... A novel intelligent optimal control methodology for energy balancing of microgrids with renewable energy and storage batteries. J. Energy Storage, 90 (2024), Article 111657.

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