Microgrid and Artificial Intelligence Magazine

Emerson"s Brett Benson shares his view of the future of power generation in this QuickChat interview for Microgrid Knowledge"s Rod Walton. Last month, the North American Electric Reliability Corporation (NERC) said that U.S. power grids are becoming more susceptible to cyberattacks every day ...

This research investigates implementing and optimizing microgrid energy management systems (EMS) utilizing artificial intelligence (AI). Inspired by the need for efficient resource utilization and the limitations of traditional control methods, it addresses essential aspects of microgrid design, such as cost-effectiveness, system capacity, power generation mix, and customer satisfaction. ...

Nowadays, DC microgrids are preferred in the field of renewable energy. The autonomous DC microgrids aim to provide smooth power flow from renewables to loads. While satisfying certain load profiles and sustaining the power as the desired level, the control of power converters is considerable. To ascend the resilience of DC microgrids, battery storage systems (BSSs) are ...

Figure 5 illustrates the IDC circuit within the microgrid, employing artificial intelligence. Additionally, Figure 6 illustrates the architecture of the proposed controller, structured as a DNN. The first architecture takes the input voltage and output current of frequency DGs and performs the role of a P ...

year of artificial intelligence in the Micro Smart grid; this search was performed with Scopus Preview, the largest database of abstracts and citations of peer-reviewed litera-

In ongoing research, the system uses AI to determine when the grid may be faltering. Then - ahead of an outage - the AI islands the microgrid and creates a smart city in which the buildings on the engineering campus continue to be powered. "The whole engineering campus operates like an independent city, complete by itself with its own generation and ...

DC microgrids can be operated under a hierarchical control strategy, and it needs a communication-based layer. The implementation of digital controllers and the communication infrastructure can make a dc microgrid vulnerable to cyber-attacks. This article introduces an approach based on Artificial Intelligence (AI) to detect and mitigate cyber ...

The reliability issues faced by standalone DC microgrids can be managed by interlinking microgrids with a power grid. An artificial intelligence-based Icosf control algorithm for power sharing and power quality ...

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Artificial Intelligence for Microgrid Resilience: A Data-Driven and Model-Free Approach Abstract: Extreme weather events, which are characterized by high impact and low probability, can ...

AI tasks such as regression and classification in microgrids are discussed using methods including machine learning, artificial neural networks, fuzzy logic, support vector machines, etc. The advantages, limitation, and future trends of AI applications in microgrids are discussed. Index Terms--Microgrid, artificial intelligence, energy

Artificial intelligence (AI) techniques continue to evolve in DC Microgrids with the aim of perfect voltage profile, minimum distribution losses, optimal schedule of power, planning and ...

Artificial intelligence-based detection and mitigation of cyber disruptions in microgrid control. Author links open overlay panel Tambiara Tabassum, Steven Lim, ... Microgrids are smaller grid-like systems formed by the connectivity of distributed generation (DG), energy storage, electric vehicles (EV), loads, and communication infrastructure ...

An artificial intelligence-based Icosf control algorithm for power sharing and power quality improvement in smart microgrid systems is proposed here to render grid-integrated power systems more ...

Marshall Worth, senior project manager AI at PowerSecure, discusses artificial intelligence and a practical approach that microgrid customers can take today to achieve their energy goals of the future. "Alexa, reduce my energy costs!" With as fast as technology has progressed over the last decade, and with the promise of self-driving cars on the horizon and ...

Artificial Intelligence. View all. ... AI Magazine connects the leading AI executives of the world"s largest brands. Our platform serves as a digital hub for connecting industry leaders, covering a wide range of services including media and advertising, events, research reports, demand generation, information, and data services. ...

Artificial Intelligence-Based Hierarchical Control Design for Current Sharing and Voltage Restoration in DC Microgrid of the More Electric Aircraft Abstract: In the conventional droop control method employed in the primary control layer, there is an inherent tradeoff between current-sharing accuracy and voltage regulation. Consequently, to ...

Growing concerns about the energy and environmental crisis are accelerating the transition to a sustainable energy generation landscape through the integration of distributed generators (DGs) into the electric power systems. Microgrids (MGs) have developed as autonomous, localized energy solutions for integrating DGs, improving grid functionality and ...

Intelligent EMS: Advanced EMS solutions utilize artificial intelligence, machine learning, and optimization algorithms to efficiently manage the generation, storage, and consumption of energy within microgrids [132], [133], [134]. These systems continuously monitor and forecast energy demand and generation, dynamically optimize energy dispatch, and ...

A characteristic feature of the modern electric power industry in recent decades is the sharp increase in electricity consumption. This can be explained by technological, social, economic, and ...

Microgrids often include renewable energy sources, ... Robotics Artificial Intelligence Magazine November 2024 Feature Humanoid Robots. Let"s Build the AI Robots of Our Sci-Fi Dreams 2h.

Artificial Intelligence (AI) is a branch of computer science that has become popular in recent years. In the context of microgrids, AI has significant applications that can make efficient use of available data and helps in making decisions in complex practical circumstances for a safer and more reliable control and operation of the microgrids.

Implementation of Artificial Intelligence (AI) techniques seems to be a promising solution to enhance the control and operation of microgrids in future smart grid networks.

Microgrids have emerged as a key element in the transition towards sustainable and resilient energy systems by integrating renewable sources and enabling decentralized energy management. This systematic review, conducted using the PRISMA methodology, analyzed 74 peer-reviewed articles from a total of 4205 studies published between 2014 and 2024. This ...

Energy Management in Hybrid Microgrid using Artificial Neural Network, PID, and Fuzzy Logic Controllers. April 2022; ... Applications of Artificial Intelligence, 2020;O ct;95:103894.