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Title: Application of Smart Microgrid Control Technology

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Abstract: This research discusses about the design and execution of a direct current (DC) microgrid system that leverages Internet of Things (IoT) technology. The microgrid combines various green energy sources, ...

Effective control systems are essential for ensuring smooth integration, managing energy storage systems, and maintaining microgrid safety. In this study, a review of recent control methods applied in ...

Smart microgrids are emerging as a pivotal solution within this framework, offering localized energy management that aligns with sustainability goals. These systems leverage diverse distributed energy resources (DERs), ...

Hybrid storage solutions combining battery systems, hydrogen technologies, and pumped hydro storage were identified as effective approaches to mitigate RES intermittency and balance ...

Microgrids (MGs) technologies, with their advanced control techniques and real-time monitoring systems, provide users with attractive benefits including enhanced power quality, stability, sustainability, and ...

Additionally, the paper examines the application of cutting-edge technologies like machine learning, blockchain, reinforcement learning, neural networks, edge computing, and the internet of things ...

A microgrid is a group of interconnected loads and distributed energy resources that acts as a single controllable entity with respect to the grid. It can connect and disconnect from the grid to operate in ...

Key findings highlight the superiority of adaptive and AI-driven controls in handling non-linear and complex microgrid dynamics, though challenges like computational complexity and cybersecurity remain.

This research identifies and classifies six control techniques as the principal conceptual development framework of control modelling for innovative microgrid applications.

Model Predictive Control (MPC), Adaptive Sliding Mode Control (ASMC), and Artificial Neural Networks (ANN) are some of the more advanced techniques that make systems more ...

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