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Intelligent control of wind and solar hybrid system

Overview

This study proposes intelligent control strategies for optimizing the grid integration of photovoltaic (PV) and wind energy in hybrid systems using an adaptive neuro-fuzzy inference system (ANFIS).What is the energy management system for a stand-alone hybrid system?

In 11 the energy management system was implemented for a stand-alone hybrid system with two sustainable energy sources: wind, solar, and battery storage. To monitor maximum energy points efficiently, the P&O algorithm was used to control photovoltaic and wind power systems. The battery storage system is organized via PI controller.

Why do hybrid systems need a controller-based ANFIS?

In hybrid systems powered by renewable energy sources, the storage system is crucial to preserving consistent and dependable power quality. Its erratic and unpredictable character is the reason behind this. To effectively regulate the bidirectional converter, this work provides an intelligent controller-based ANFIS.

Can a micro-grid hybrid power conversion system meet continuous load requirements?

The goal of this study is to look into a control approach for a micro-grid hybrid power conversion system that integrates multiple power sources and transformers to meet continuous load requirements under a variety of naturalistic settings.

Are microgrids the future of power systems?

For future power systems, microgrids are one of the most significant considerations. In order to meet future energy demands, mitigate climate change and support sustained growth, renewable energy sources emerged.

How to monitor maximum energy points efficiently in photovoltaic and wind power systems?

To monitor maximum energy points efficiently, the P&O algorithm was used to control photovoltaic and wind power systems. The battery storage system is organized via PI controller. This study aimed to improve the energy quality and ensure that the optimal voltage level is maintained.

How can photovoltaic and wind systems achieve maximum power?

The maximum possible power of the photovoltaic and wind systems can be achieved thanks to the proposed MPPT technique, which has shown good results compared with the techniques mentioned in the literature.

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