

# Intelligent control of solar photovoltaic power generation

What is intelligent control in PV system?

Intelligent control as a more advanced technology has been integrated into the PV system to improve system control performance and stability. However, intelligent control for the PV system is still in the early stages due to the extensive calculation and intricate implementation of intelligent algorithms.

Can artificial intelligence control energy management PV systems?

Fig. 11 provides a schematic representation of the suggested artificial intelligence control of energy management PV systems. A photovoltaic (PV) generator, a battery management system (BMS), a boost converter, and an alternating current (AC) load fitted with a neurofuzzy control system make up the primary elements of the power system.

How do grid-tied photovoltaic systems improve energy security?

Their incorporation into grid networks improves energy security by diversifying the energy mix and aids in the reduction of greenhouse gas emissions. The evolution of grid-tied photovoltaic systems has led to the development of multi-functional energy conversion systems that extend beyond mere power generation.

What is a solar photovoltaic system?

Introduction Solar photovoltaic (PV) systems have become integral to modern energy infrastructures, offering sustainable and environmentally friendly power generation. Their incorporation into grid networks improves energy security by diversifying the energy mix and aids in the reduction of greenhouse gas emissions.

**ABSTRACT** Photovoltaic (PV) systems are highly sensitive to stochastic environmental variations, particularly irradiance and temperature, which complicate the task of consistently ...

Among renewable energy sources, solar power has emerged as the most accessible and economically viable long-term solution to address both growing energy demands and environmental ...

In today's society, solar energy production plays a critical role. This project involves converting renewable energy into electrical power and integrating it with an existing system that ...

Abstract PV power generation is developing fast in both centralized and distributed forms under the background of constructing a new power system with high penetration of renewable ...

This paper introduces a dual-objective control framework for standalone photovoltaic (PV) systems that uniquely integrates maximum power point tracking (MPPT) with precise DC load ...

Power quality upgrade in grid-connected photovoltaic systems ensures stable and highly efficient operation of modern energy grids. Meanwhile, the high penetration of renewable energy ...

Solar photovoltaic (PV) systems have become integral to modern energy infrastructures, offering sustainable

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and environmentally friendly power generation [1]. Their incorporation into grid ...

The utilization of artificial intelligence (AI) is crucial for improving the energy generation of PV systems under various climatic circumstances, as conventional controllers do not effectively ...

This study provides a paradigm for an artificial intelligence-driven hybrid solar power system, including optimized solar tracking with advanced technology, advanced photovoltaic (PV) ...

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