

Can machine learning improve solar power generation efficiency?

The obtained results suggest that the proposed machine learning models can effectively enhance the efficiency of solar power generation systems by accurately predicting the required measurements. Recent advancements in artificial intelligence (AI) and the Internet of Things (IoT) have spurred innovative approaches in various domains.

Do dye-sensitized solar cells achieve high power-conversion efficiencies?

Here, we demonstrate a dye-sensitized solar cell (DSC) that achieves very high power-conversion efficiencies (PCEs) under ambient light conditions.

Can XAI be used for solar power generation forecasts?

The goal is to get a better understanding of how to apply XAI techniques to solar power generation forecasts and how to interpret "black box" machine learning models for usage in solar power station applications. In this paper, the Long-Short Memory (LSTM) is assumed to be the primary black-box model.

How do statistical metrics affect the performance of solar energy generation?

Numerous statistical metrics are used to evaluate the precision of models created to forecast the performance of solar energy generation. These criteria largely concentrate on quantifying the disparities between the projected values and the real measurements.

What is energy in China's new era?

The white paper Energy in China's New Era lays out Beijing's "new development philosophy that emphasizes an innovation through meaningful supply-side structural reform. Beijing is also prepared to launch sweeping reforms for its energy sector, including diversifying supplies, raising efficiency, finding cleaner sources, and in-

Could a dye-sensitized solar cell power the Internet of things?

This translates into a PCE of 28.9%. A dye-sensitized solar cell that has been designed for efficient operation under indoor lighting could offer a convenient means for powering the Internet of Things.

In 2018, solar photovoltaic (PV) electricity generation saw a record 100 GW installation worldwide, representing almost half of all newly installed renewable power capacity, and surpassing all ...

Zhou et al. [68] proposed a hybrid integrated deep learning framework to predict short-term PV power generation in a time series manner. Yi et al. [89] combined the Data envelopment analysis (DEA ...

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Solar power generation is a sustainable and clean source of energy that has gained significant attention in recent years due to its potential to reduce greenhouse gas emissions and mitigate ...

This paper proposes a model called X-LSTM-EO, which integrates explainable artificial intelligence (XAI), long short-term memory (LSTM), and equilibrium optimizer (EO) to reliably forecast solar power ...

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