

# Intelligent Wind Power Generation System





## Overview

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Can artificial intelligence improve wind power generation?

The optimization of wind power generation for both economic and environmental benefits has emerged as a solution to contemporary energy challenges. Artificial intelligence (AI), particularly machine learning (ML), enhances the efficiency and sustainability of power generation in wind energy systems.

What is a wind power generation system (WPGS)?

This scholarly paper offers a wind power generation system (WPGS) that utilizes a configuration of parallel five-phase permanent magnet synchronous generators (PMSGs). The control mechanism for this system is based on a fifteen-switch rectifier (FSR) topology, which is specifically designed for grid-connected applications.

What is wind power technology?

Wind power technology represents a clean, environmentally sustainable approach to electricity generation. WTs operate without fuel consumption, which eliminates carbon dioxide emissions and other harmful air pollutants associated with conventional power generation methods (Jaber 2014).

How ML technology is advancing wind power generation?

ML technology, as a core branch of AI, along with hybrid AI models that integrate data preprocessing methods and AI optimization algorithms, has become essential for advancing wind power generation. Meanwhile, AI-driven wind energy systems have a profound impact on socioeconomic development and energy transition.



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