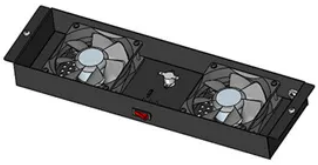
Wind farm power generation excess reward method



Overview

Novel reward strategies related to the energy deviation from the rated power are defined. They are designed to improve the efficiency of the WT. Two new categories of reward strategies are proposed: “only positive” (O-P) and “positive-negative” (P-N) rewards. Ramp rate limitation, coupled with storage systems, is one of the most frequently used control strategies for the intermittent nature of wind power. The relationship of these categories with. A reward regularization (RR) module is designed to estimate wind turbines' normalized power outputs under different yaw settings and uncertain wind conditions, which brings strong robustness and adaptability to the proposed control scheme. The recent figure shows that 93GW new wind capacity was installed worldwide in 2020, leading to a 53% year-on-year increase. Control system is the core in wind farm.

Article Content

Reinforcement learning to maximize wind turbine energy generation

The ideal reward should guide the agent to obtain the maximum power production regardless of the wind conditions. For example, to teach the agent to maximize the power controlling only the yaw angle, ...

Wind Farm Control Technologies: From Classical Control to

The wind industry has recognized that new technologies are needed to handle wind farm control tasks, especially for large-scale ofshore wind farms. This paper provides a comprehensive review of the ...

Exploring Reward Strategies for Wind Turbine Pitch Control by ...

Novel reward strategies related to the energy deviation from the rated power are defined. They are designed to improve the e ciency of the WT. Two new categories of reward strategies are proposed: ...

Intelligent wind farm control via deep reinforcement learning and ...

Wind farms'' power-generation efficiency is constrained by the high system complexity. A novel deep reinforcement learning (RL)-based wind farm control scheme is proposed to handle this challenge ...

Maximizing wind farm production through pitch control using graph ...

Abstract This article presents a novel methodology to maximize wind farm power generation by integrating graph neural networks (GNN), supervised learning, and reinforcement ...

Analysis of Semi-Markov Reward Processes Motivated by Ramp Rate ...

Ramp rate limitation, coupled with storage systems, is one of the most frequently used control strategies for the intermittent nature of wind power. This strategy, together with a penalty ...

Distributed Operation of Wind Farm for Maximizing Output Power: A ...

During the training process, WTG agents use different deep neural networks (DNNs) to improve their actions for achieving the higher reward in the long run by optimizing the weights of DNNs in each ...

Reward adaptive wind power tracking control based on deep ...

From the simulation, the control method proposed in this paper can effectively improve the power generation efficiency under turbulent wind speed, reduce the pitch angle variation by about ...

Reward and punishment mechanism for guiding wind power plant to ...

The invention discloses a reward and punishment mechanism for guiding a wind power plant to participate in source-network coordination, which is used for relieving the problem of power...

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