AI-Based Urban Energy Optimization System

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Abstract

Urban regions' growing energy use poses serious problems for system stability, sustainability, and efficiency. This work presents a cutting-edge AI-driven system that uses machine learning (ML) and deep learning (DL) techniques to optimize urban energy use. The suggested system forecasts demand, optimizes energy distribution, and integrates renewable energy sources using smart meters, Internet of Things devices, and historical energy data. This framework guarantees real-time decision-making for improved grid management and energy efficiency by utilizing neural networks and reinforcement learning. To increase prediction accuracy and flexibility, special attention is paid to the gathering and preparation of high-quality energy datasets. This project's main objective is to use AI-driven automation and optimization techniques to enable smart cities to attain energy efficiency, lower carbon footprints, and guarantee a steady energy supply.

Keywords

PSmart Grid, Renewable Energy Management, AI-Based Energy Optimization, Reinforcement Learning, Energy Demand Forecasting, Sustainable Urban Development.