

Deep Learning in Renewable Energy Optimization Through IoT-Based Smart Grid Technologies

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Abstract:

The transition to renewable energy sources necessitates intelligent energy management systems capable of optimizing generation, distribution, and consumption. This research investigates the integration of deep learning algorithms with Internet of Things (IoT)-enabled smart grid technologies to enhance renewable energy optimization. By leveraging real-time data from distributed sensors and renewable energy sources—such as solar and wind—deep learning models predict energy demand, detect faults, and optimize energy distribution patterns. The study evaluates various deep learning architectures, including convolutional and recurrent neural networks, for their performance in dynamic energy environments. Results indicate significant improvements in energy efficiency, grid reliability, and decision-making processes, thereby supporting sustainable urban infrastructure development.

Keywords:

Deep learning, renewable energy, IoT, smart grid, energy optimization, sustainable infrastructure.

REQUEST FOR FULL TEXT

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