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Air Quality Monitoring Optimization Using IoT-Based Deep Learning and Neural Network Techniques

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Abstract:

Air quality monitoring is crucial for public health and environmental sustainability, especially in urban environments. This research investigates the optimization of air quality monitoring systems using Internet of Things (IoT)-based deep learning and neural network techniques. The study combines IoT sensor networks for real-time air quality data collection with advanced machine learning models, specifically deep learning and neural networks, to predict air pollution levels and identify harmful trends. The deep learning models, including recurrent neural networks (RNNs) and long short-term memory (LSTM) networks, are trained to process vast amounts of time-series sensor data to provide accurate forecasts and detect anomalous pollution events. The optimization focuses on improving data accuracy, reducing false alarms, and enhancing the efficiency of air quality prediction models. By integrating these techniques, the system offers actionable insights for policymakers and urban planners to implement timely interventions aimed at improving air quality. The results demonstrate that IoT-based deep learning systems can significantly enhance air quality monitoring and management, leading to healthier urban environments.

Keywords:

Air quality monitoring, IoT, deep learning, neural networks, pollution prediction, urban environments.

REQUEST FOR FULL TEXT

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