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Smart Cities Air Quality Monitoring Using Deep Learning and IoT-Based Neural Networks

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Abstract:

Air quality monitoring is a critical aspect of urban sustainability, especially in the context of rapidly growing smart cities. This study explores the integration of deep learning techniques and Internet of Things (IoT)-based neural networks for real-time air quality monitoring in urban environments. The research proposes a hybrid approach combining IoT sensor networks with advanced deep learning models, such as Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks, to predict and optimize air quality indices across various urban zones. The IoT infrastructure collects data from a network of distributed air quality sensors deployed in strategic locations throughout the city. This real-time data is then processed by the neural network models to detect pollution sources, forecast air quality trends, and provide actionable insights for urban planning and public health initiatives. The results demonstrate the potential of this system to provide accurate, real-time air quality monitoring and early warnings about hazardous pollution levels, supporting efforts to reduce environmental risks and enhance the quality of life in smart cities.

Keywords:

Smart cities, air quality monitoring, deep learning, IoT, neural networks, pollution prediction.

REQUEST FOR FULL TEXT

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