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Neural Networks for Air Quality Monitoring Optimization in IoT-Based Smart City Environments

Sam M. K., Hakan Khan, Najaad OubeBlika

1. The Higher Institute of Telecommunication & Engineering, Information Technology Department, Philippines
2. Department of Industrial Technology Engineering, Turkish-German University, Istanbul 34820, Turkey
3. Energies Materials and Industrial Engineering Research Center, Faculty of Sciences and Technology, University of Tamanghasset, Tamanrasset, 10034, Algeria

Abstract:

Air quality monitoring in urban environments is crucial for maintaining public health and sustainability in smart cities. This study proposes an optimization framework for air quality monitoring systems that integrates neural networks with Internet of Things (IoT) technologies. IoT sensors collect real-time data on pollutants such as PM2.5, PM10, NO_2, and CO_2, which are then processed using deep learning models, including convolutional neural networks (CNNs) and recurrent neural networks (RNNs), to predict air quality levels and detect trends. Feature selection and data fusion techniques are employed to enhance the accuracy and efficiency of the models. Experimental results show that the proposed approach improves air quality prediction accuracy and enables proactive responses to air pollution, contributing to smarter urban management.

Keywords:

Air quality, neural networks, IoT, smart city, monitoring optimization, deep learning.

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