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An IoT based Environment Monitoring System

Omkar Bhagwan Khilari, Rushikesh Nagorao Anarwad, Rushikesh Dinesh Borekar
Dr. Bhausaheb Eknath Shinde, Prof. Snehal Khartad
Department of Electronics and Telecommunication Engineering
Dhole Patil College of Engineering, Kharadi, Pune, India

Abstract: *With increasing environmental awareness, the demand for robust environmental monitoring systems has surged. Such systems play a pivotal role not only in safeguarding the environment but also in ensuring occupational safety, particularly in hazardous industries such as mining. However, large-scale sensor deployment poses significant challenges related to data collection, management, connectivity, and power consumption. Leveraging IoT technology, this paper introduces a novel framework for environmental monitoring utilizing sensors, microcontrollers, and IoT infrastructure. Our system enables users to monitor temperature, humidity, and detect harmful gases indoors and outdoors. Data is securely stored on a web server, accessible globally via the internet. Additionally, we present a web application offering real-time data visualization and customizable notification alerts for critical sensor readings. Compared to existing systems, our solution offers cost-effectiveness, accuracy, user-friendliness, and cloud- based architecture. Extensive evaluation demonstrates the system's high accuracy and reliability across diverse operating conditions, underscoring its potential for widespread adoption in environmental monitoring applications.*

Keywords: IoT, environment, big data, machine learning

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