NOISE POLLUTION MONITERING USING IOT

Abstract

➢ Noise pollution has become a significant environmental concern in urban areas, negatively impacting the health and well-being of residents. This abstract presents an overview of a comprehensive noise pollution monitoring system designed to address the growing challenges associated with excessive urban noise. The proposed system integrates advanced sensor technology, data analytics, and real-time reporting to monitor, assess, and mitigate noise pollution effectively.

SENSOR MODULE

Microphone Sensors:

➢ High-quality microphones capable of capturing a wide range of sound frequencies and amplitudes.

Environmental Sensors:

➢ Additional environmental sensors for measuring temperature, humidity, and air quality, which can help contextualize noise data.

Data Acquisition and Preprocessing:

Analog-to-Digital Converter (ADC):

➢ Converts analog microphone signals into digital data.
➢ Noise Filtering: Preprocesses the data to remove interference or non-noise signals.
➢ Calibration: Ensures accuracy and consistency of the collected noise data.

Battery Management:

➢ Ensures sensors have efficient power usage and may include solar panels or rechargeable batteries
➢ Low-Power Modes: Sensors can enter low-power states when not actively collecting data.

Real-time Alerts:

➢ Generates alerts or notifications when noise levels exceed predefined thresholds.
➢ Visualization: Presents data in user-friendly visual formats like charts, graphs, and heatmaps.
➢ Reporting: Provides reports on noise levels, sources, and trends for decision-makers and the public

Web-Based Dashboard:

➢ Offers a user-friendly interface for administrators, policymakers, and the public to access noise data and reports.
➢ Mobile Application: Provides mobile access to noise information and allows users to submit noise complaints or feedback.

Data Processing Algorithms:

➢ Utilizes algorithms for noise level calculations, frequency analysis, and event detection.
➢ Machine Learning Models: Employ machine learning techniques to classify noise sources and identify patterns in the data.

Data Transmission Module

➢ Developing a noise pollution monitoring module involves close collaboration with experts in acoustics, data science, and environmental science to ensure the system's accuracy and effectiveness in addressing noise pollution challenges

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