Smart Environmental Monitoring System

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ABSTRACT

In today's world, air pollution has become a common phenomenon everywhere, especially in the urban areas, air pollution is a real-life problem. In urban areas, the increased number of hydrocarbons and diesel vehicles and the presence of industrial areas at the outskirts of the major cities are the main causes of air pollution. The problem is seriously intense within the metropolitan cities. The governments around the world are taking measure in their capability. The main aim of this project is to develop a system which may monitor and measure pollutants in the air in real time, tell the quality of air and log real-time data onto a remote server (Cloud Service). If the value of the parameters exceeds the given threshold value, then an alert message is sent with the GPS coordinates to the registered number of the authority or person so necessary actions can be taken. The Arduino board connects with Thingspeak cloud service platform using ESP8266 Wi-Fi module. The device uses multiple sensors for monitoring the parameters of the air pollution like MQ-135, MQ-7, DHT-22, sound sensor, LCD.

KEYWORDS
Arduino, DHT-22, ESP8266 Wi-Fi Module, IoT, LCD, MQ-135, MQ-7

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INTRODUCTION

Air and sound pollution are the biggest problem of every nation, whether it is developed or developing. Health issues are quicker rate particularly in urban areas of developing countries whereas manufacture and growing variety of vehicles ends up in unleash of heap and foamy pollutants and makes noisy sound (Tudose, Pătraşcu, Voinescu, Tataroiu, & Țăpuș, 2011). Harmful effects of pollution include mild allergic reactions such as irritation of the throat, eyes and nose, headache, insomnia as well as some serious problems like bronchitis, heart diseases, pneumonia, lung and aggravated asthma (Dias et al., 2010). According to a survey, the combined effects of ambient (outdoor) and household air pollution cause about 65 lakhs premature deaths every year in all over world whereas in India, air pollution cause about 10 to 15 lakhs premature deaths every year. Various forms of phylogeny emissions named as primary pollutants are pumped into the atmosphere that undergoes reaction and more ends up in the formation of latest pollutants usually known as secondary pollutants (Asmi, Putra, & Rahman, 2016). To monitor the conditions in case of beyond the set level of parameters (e.g., noise, CO levels) an efficient environmental monitoring system is needed. In such environment when LED alerts automatically or some event occurs the alarm. Smart Environmental Monitoring System monitors and controls the ecological changes on animals, plants and human beings on the effects due to environmental changes. Initially the sensor devices are deployed in environment to detect the parameters (e.g., noise, CO levels, etc.) while the data acquisition, computation and controlling action (e.g., with respect to the specified levels, the variations in the noise and CO levels). To predict the behavior of a particular area of interest and to collect the data, the sensor devices are placed at different locations. The solution additionally provides an intelligent observance for a specific space of interest. The quality of air is very important for the survival of living beings. It is necessary to watch air quality and keep it in restraint for a much better future and healthy living for all. The main objective of this project is to monitor the quality and pollution of air. The level of pollution in air can be measured by measuring the pollutants such as humidity level, temperature level, CO level, smoke level etc. present in the air of that area. Here we propose an air quality pollution monitoring system that allows us to monitor and check real-time air quality in a particular area through IoT.

LITERATURE SURVEY

Mobile Air Quality Monitoring Network (MAQUMON), it consists of a number of car-mounted sensor nodes measuring different pollutants in the air. The data points are labeled with location co-ordinates and time utilizing an on-board GPS. Periodically, the values are uploaded to a server, processed and then published on the Microsoft SensorMap portal. Given an ample variety of nodes and various quality patterns, a detailed picture of the air quality in a large area will be obtained at a low cost. Sensor
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