

A Smart Environmental Monitoring System Using Internet of Things

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ABSTRACT

This system consists of air pollution sensors array, Global Positioning system of mobile phone, single chip microcontroller, Bluetooth modem. Sensors are hardware devices that produce measurable response to a change in a physical condition of air pollution. The analog signal send by the sensors is digitized by an analog to digital converter and send to controller for further processing. CO, N, smoke and temp sensor senses the gas and communicate the data with microcontroller. Bluetooth modem is used for transmitting the data to mobile. The main objective of this system is to continuously monitor the pollution level provided by the different sensor via Bluetooth modem at the control section. Hence particular plan of action should be taken to control the air pollution.

Keywords: Global Positioning system of mobile phone, single chip microcontroller, Bluetooth modem, Sensors.

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I. INTRODUCTION

Internet of Things where 'things'- sensors and devices transmit data directly to the Internet has become an enabling technology eco-system with several application areas are Smart Home, Smart Farming, Smart Grid, Industrial Internet, Connected Health, Smart Supply Chain etc. The application list is impressive, however, since the technologies involved are many- sensors, microcontrollers, wireless networking, cloud based services, mobile apps, web pages -practical implementation of an IoT application is complex. Present innovations in technology mainly focus on controlling and monitoring of different activities. These are increasingly emerging to reach the human needs. Most of this technology is focused on efficient monitoring and controlling different activities. An efficient environmental monitoring system is required to monitor and assess the conditions in case of exceeding the prescribed level of parameters (e.g., noise, CO and radiation levels). When the objects like environment equipped with sensor devices, microcontroller and various software applications becomes a self-protecting and self-monitoring environment and it is also called as smart environment. In such environment when some event occurs the alarm or LED alerts automatically. The effects due to the

environmental changes on animals, plants and human beings can be monitored and controlled by smart environmental monitoring system. By using embedded intelligence into the environment makes the environment interactive with other objectives, this is one of the application that smart environment targets.

II. PROBLEM STATEMENT

Air pollution monitoring is considered as a very complex task but nevertheless it is very important. Traditionally data loggers were used to collect data periodically and this was very time consuming and quite expensive. The use of WSN can make air pollution monitoring less complex and more instantaneous readings can be obtained from different area wise located sensor.

Air Quality Monitoring:

Air pollution in large urban areas may have a significant impact on human health and on the environment. Urban air quality is usually monitored by highly reliable networks of fixed stations. A fixed

monitoring station can accurately measure a wide range of pollutants. However, permanent monitoring stations are frequently placed so as to measure ambient background concentrations or at potential hotspot locations, and they are usually several kilometers apart. Urban pollution varies spatially, as it is reasonable to expect, accordingly to human activities, topography, and local micrometeorology.

III. LITERATURE SURVEY

Mihaela Oprea, A knowledge based approach for PM2.5 air pollution effects analysis(2014).

The paper presents a knowledge based approach applied to air pollution facts analysis in the case of PM2.5 air pollutant which has potential significant negative effects on human health. The use of knowledge derived from various sources (e.g. literature, databases, questionnaires, human experts experience, and decision tables) via manual, semiautomatic and automatic methods is proposed for a multi-parameters analysis of the PM2.5 air pollution episodes effects on vulnerable people such as children and elderly. Some measures to reduce the negative effects on human health are also proposed by our approach.

R.A.Roseline, Pollution Monitoring using Sensors and Wireless Sensor Networks : A Survey(2013).

Air pollution has significant influence on the concentration of constituents in the atmosphere leading to effects like global warming and acid rains. To avoid such adverse imbalances in the nature, an air pollution monitoring system is utmost important. Wireless Sensor Networks is an excellent technology that can sense, measure, and gather information from the real world and, based on some local decision process transmit the sensed data to the user. These networks allow the physical environment to be measured at high resolutions, and greatly increase the quality and quantity of real-world data and information for applications like pollution monitoring. In this paper, a survey on pollution sensors and pollution monitoring systems using Wireless sensor Networks is presented.

Dr. B. Sengupta Guidelines for Ambient Air Quality Monitoring(2003).

Air pollutants are added in the atmosphere from variety of sources that change the composition of atmosphere and affect the biotic environment. The concentration of air pollutants depend not only on the quantities that are emitted from air pollution sources but also on the ability of the atmosphere to either absorb or disperse these emissions. The air pollution concentration vary spatially and temporarily causing the air pollution pattern to change with different locations and time due to changes in meteorological and topographical condition. The sources of air pollutants include vehicles, industries, domestic sources and natural sources. Because of the presence of high amount of air pollutants in the ambient air, the health

of the population and property is getting adversely affected.

Parul Choudhary, Air Pollution Analysis using Ontologies and Regression Models,(2016)

Air pollution control in city ranges is one of the fundamental requests of examination in the natural sciences. For each and every traverse the defilement reasons and pollution scattering are divergent, dependent on the assembling consideration, on vehicles activity, on inner sources et cetera, and addition ally on the topographical area, temperature of the air, rate and relationship of the wind, and supplementary meteorological conditions components. Innumerable scientific models are used for the portrayal of the associations in the midst of natural security and meteorological elements.

IV. PROPOSED SYSTEM



Fig 1. System architecture

Module:

The goal of building a smart city is to improve quality of life by using technology to improve the efficiency of services and meet residents' needs. Information and Communication Technology allows city officials to interact directly with the public to tell what is happening in the city, how the city is evolving, and how to enable a better quality of life. A Smart City is one with at least one initiative addressing one or more of the following six characteristics: Smart Governance, Smart People, Smart Living, Smart Mobility, Smart Economy and Smart Environment. We are going to develop an app that is going to bear a hand in this campaign. Consider an area that is being surveyed for estimating how much the area is affected by pollution. The constituents of air along with its proportion are calculated and if it is higher than normal then the officials are intimated about it. Then the people are evacuated to a safe place.

V. ACKNOWLEDGEMENT

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VI. CONCLUSION

The system utilizes sensor to collect pollutant gases such as CO, N, smoke and temperature. The data shows the pollutant levels and their to local air quality standards.

Here successfully design the android application which shows the real time air pollution data /air pollutants can be accessible from anywhere here have designed circuit which takes corrective action on the increase of air pollution on the particular threshold value.

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