AIR QUALITY MONITORING SYSTEM

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Abstract

In our lives air pollution is a big worry all over the world air pollution among other contaminants such as water pollution, soil pollution, marine pollution, noise pollution, light pollution, heat pollution, and so on, is the most deadly and harmful. Air contamination is a primary cause of diseases like asthma, cancer, bronchitis, congenital defects, and immune system abnormalities. Our Project will use a combination of applications, servers, and CO_2, CO, PROPANE, and methane (CH_4) gas sensors to estimate air quality and show you what the true situation is, including wind and weather. This device may be used to monitor a range of gases at the same time, which addresses the disadvantages of the conventional air quality sensor. The most difficult aspect will be that this system will offer real-time information on ambient air quality based on existing air quality regulations. The system will offer the user with weather information that is forecasted in advance, as well as information on how polluted the ambient weather is. This system will do a lot of things, including determining how safe it is in smart cities, where people have less and less time to spend and the weather is becoming dirtier.

The goal is to make it as sensitive as possible to the people in all the communities that use and, if any, research, organization, would like to do follow-up research, a part of the nominal amount of money to be invested, that would be a great

solution for a particular station, that is, a control of the quality management system of air

.Objectives

The following are the primary goals of this project:

1. Develop and create a low-cost, real-time pollution index (API) system using the sensors, Arduino Microcontroller, and LCD.

2. To create a portable API acquisition device that is both light and easy to carry.

3. Experiments & testing will be used to evaluate the performance of the proposed system.

Introduction

We came to read in news about air pollution every day, people get sick, due to issues of Global warming and air pollution, the end result will be in people's lives. From a top-down perspective, each developing nation is suffering from the Air Pollution. The main cause of climate change and human health is pollution in air. This has resulted in changing of climates and, a global energy shortage, the rain, drought, storm, hard rain, fog, etc, for the Living creatures on land and under water, which is suffering from the many problems that life has changed because of the lack of well-being. The weather is the most useful thing for each and every living being, he would have left

right away. Intelligence of air pollution is a very serious problem, the main objective of this scheme is to evaluate the readings of our air, for the people, and all of the other living things on earth from existing ones. It is very important to our lives, in order to know the degree of certainty we have is now, and how much the weather has changed as a result of air pollution. This Project will help you to find answers to your questions in the air. Of the four gas sensing devices, which are mainly accountable for the main air pollutants, are available in the system in order to find out what is the best score of any state in the air. The CO_2, CO, and relative humidity are the ones that are most responsible for air pollution, and we had tried to incorporate all of these readings in our system

Literature Survey

The environmental pollution is increasing at a dangerous rate, each and every day. The most critical part of the environment that is polluted by the element that is released into the air. For more information about air pollution and air quality, the proposed system consists of a wireless sensor network, which is mainly for the monitoring of contaminants that are present in the city. This is a low budget, the monitoring system with a cheap, but effective, and the sensors. Some of the earlier works, such as the Intelligent Vehicle, the Environmental management System, [1] and introduced in the year 2015. He is, in principle, be

calculated level of emissions of harmful gases, which is responsible for air pollution. To learn about the hazardous gases and their impact on the system, for the monitoring of industrial air pollution was conducted in [2] in order to increase worker safety and well-being The Budget system, and air quality [3] in 2008, but it's partly because the sensors, as well as the system itself, were quite expensive at the time. It is possible to detect air pollution with the use of GPRS cellular communication technologies [4]. In order to know the air quality, wireless sensor networks based on the metropolitan pollution monitoring system are given [5]. Sung, J., He, and Wang Yu. (C) [6], lead the Development of the wireless sensor module, with the optimal conditions for the monitoring of the quality of the air in a room or the office. The experience of the monitoring can be carried out in a web-based system for the monitoring, along with other home network users of the system, a handheld device. For example, several sensors such as : temperature, humidity & carbon dioxide sensors 377$ 3(53867$.$$1781.8781$0,1$+ 8 the sensor and the flying dust of the sensor, in conjunction with a RF transmitter and a fee for the monitoring of the environment of the industry. The use of the Intel 8051 micro-computer to control the power of the electronics, by receiving signals from a COMPUTER or mobile device was done. Account, and Paulo [7] developed and implemented a system known as the Air, which is

able to measure, visualize, and share to the levels of air quality that are associated with it. The ambient air quality of the DC and 1100, for use in the measurement of the pollutants, put an Arduino-based AVR is set in the monitor, air quality, and iPod Touch devices that are used for processing, visualizing, and transmission of data, and an Arduino wireless network. The information are going to be connected, each 14 seconds, and, at the same time, the Arduino board will have to re-enter the data into a chain of signals , and it is read by the port via the mic port. The information can be sent to a central server in real-time through the Wireless Fidelity connection. Phangnga Bay, [8] have developed a dust monitoring system for in-room, in where it is to control the dust concentration in the course, and to show the expression of the personal computer in real-time. This system uses an Arduino controller, which is operated by the Shinyei PPD20V particle sensors to measure indoor concentrations of fine dust. The readings in the sensors can be transmitted to your PC in the real-time display with a Graphical user Interface (GUI) using Visual Basic software. The results that have been achieved in a number of conditions, including, among other things, a clean room, and a good room, a room with the smoke-filled foods, and cigarette smoke. The results will change depending on the location of your room. Using the device, you can increase the awareness of the impact of human involvement on air pollution, and the cause of people's health and

well-being. Ab-Rahman [9], which has been adopted as a control of the quality management program and the controller using the TGS 2600 sensor for dust. In this work, the dust concentration was displayed on an lcd screen, which is programmed using MPLAB PIC16F877A. This L.E.D indicates the dust presence status in atmosphere. The green light represents the "normal" condition, with the dust concentrations ranging from 0 to 100 parts per million. Yellow indicates a "concern," " situation, where the dust concentration is 101,200 pm, when the dust concentration is 201 ppm or greater is a "hot" situation, and the red light will be on. The unit will blip when the dust concentration reaches to the "at risk" status. Takharim [10] developed a series of sensors and zigbee modules are used in order to make a more precise and scientific readings of temperatures, humidity, and atmospheric humidity. This system has been worked out according to the surrounding situation is, the air and the ground. Its possible to obtain the value of the temp, the humidity present the air, 377$ 3(53867$.$$1781.8781$0,1$+ 9 the percentage of soil moisture content. The temperature unit, degrees Celsius, relative humidity-the unit is a percent of the relative humidity of the air, and the humidity-the unit is percent. The obtained values are made into digital signal through Arduino Microcontroller and through Zigbee module are available, and that it is used as a means of delivery. For our project, it is

composed of a transmitter and a receiver. All of these values will be displayed on your computer screen with the help of a Visual BASIC program, in order to facilitate referencing. This system provides a simple, efficient, and accurate monitoring of the system for a surround sound experience.

Sr No.	Title of Paper	Sensors Used	Technology used
1.	Intelligent Vehicle	CO2 Sensors	GPRS Technology
2.	Wireless Sensor Module	Temperature, Humidity, CO2	Intel 8051 Microcontroller along with sensors
3.	The Air	AVR and iPod Touch	IoT Enabled
4.	Dust Monitoring System	Shinyei PPD20V particle sensors	Arduino Based
5.	Control of the quality management program	TGS 2600 sensor for dust	MPLAB PIC16F877A

Classification of Air Pollutions

Carbon monoxide (CO) sources of Lead (pb), nitrogen oxide (Surge), Sulphur oxides (EMF), Particulate matter (PM), ozone (O3), and the Total Floating solids (TSS) are the six forms of air pollutants (TSP). Carbon monoxide is a gas that is colorless, odorless, and tastes like nothing else. Because the site is in the air, especially during the winter and early spring, dangerous amounts might build up in the time after the fuel's peak. Vehicle waste, in the home or structure, heat, fire, plant growth stage, and chemical methane conversions are all examples of carbon sources.
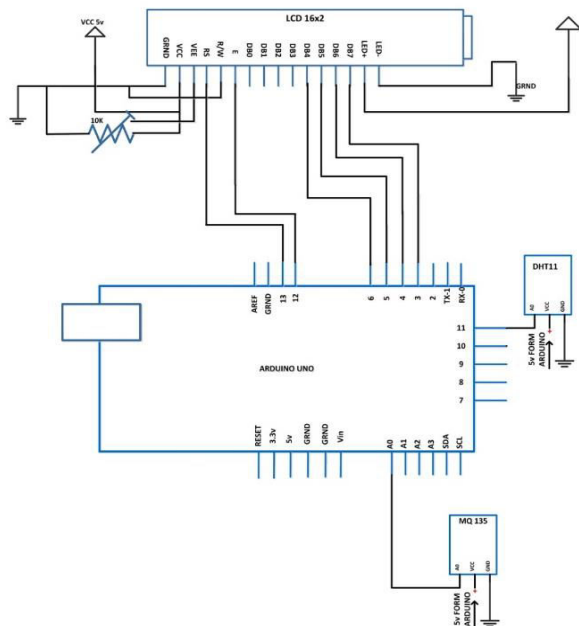
Measurement of Air Quality

Researchers have used a few methods to quantify the level of pollution in the air in recent years. The monitoring of air pollution is usually divided into 2 categories: Monitoring of source and monitoring of ambient air. Implying continuous measuring of instrumentation, certain manual methods, or remote optical sensor systems, a direct approach to monitoring can be taken. For the latter type, monitoring of source means is taking measurements of emissions from a stationary or movable source, which is usually a duct, vent, stack, or chimney. The performance of control technology is determined using stationary source data, as an to ozone & Human health risk measuring models, and to validate that specified permit limits are being met. Ambient air monitoring, on the other hand, is concerned with the occurrence of certain pollutants in the immediate surrounding atmosphere. Several equipment dedicated to measuring certain target pollutants are frequently employed in ambient air monitoring by big metropolitan stations.

Working Methodology

The Pollution of air index, or API, is a scale that calculates the intensity of pollution in air. The high the A.P.I Level, the worse is the air quality is to health of humans. Fires in rural or metropolitan areas may result in haze, which is a different type of calamity. Haze will undoubtedly have an impact on the API in the area where the fire occurred. Unreacted Gases which is an industrial waste, may have an impact on API, particularly in areas near industrial areas. The API value is critical for all inhabitants to reduce outdoor activities since a high level of air pollution signals poor air quality for humans. The majority of existing API measurement systems, on the other hand, are quite large and expensive. This project has been proposed to offer us with real-time API readings in a specific region. It is tiny, portable, and reasonably inexpensive because it is built on Arduino.

improve the community, as it will help you to identify the affected area so that we can take early action to reduce the damage, reduce the generations to come.

Conclusion

This research presents a unique technique to monitor the environment, air, and sound pollution using a low-cost, efficient, and embedded technology. The functions of various sensors and how they work were explained in the suggested architecture. They are also discussed in terms of the way they are working, their uses, their features, and their way they collect data and comparisons to regular known data. The noise and air pollution monitoring system was put to the test in order to keep track of gas levels in various sections of the country. The sensor parameters were also provided to the data server. Our project equipment proved to be effective, inexpensive, and equipped with various highly functional sensors it may, indeed, be reliable, and to all of you, and then the data is going to be the key to take any action that is necessary in order to

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