International Journal of Research in Engineering, Science and Management
Volume-1, Issue-10, October-2018
www.ijresm.com | ISSN (Online): 2581-5782

Air and Noise Pollution Monitoring System

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***Abstract*— In infrastructure and industrial plants, rapid growth causes environmental problems such as pollution (air, water, noise), climate change, malfunctions and has major implications for the requirement of intelligent, functioning, adaptable and efficient surveillance systems economically. In this context, where many computer science, wireless and energy challenges electronic communication are combined; Smart sensor networks are an emerging field of research. This document proposes a field of interest to monitor the level of air pollution and noise in an industrial environment or through the use of a wireless integrated computer system. Technologies like the Internet of Things (IoT) are a solution that is the result of a combined range of information technology and electronics. In this case, to monitor the fluctuation of parameters such as noise and air pollution from their normal level, the detection devices are connected to the integrated computer system. For the requirement of continuous monitoring, control and behavioral analysis, this model is adaptable and distributive to any infrastructure environment. The working model of the proposed model is evaluated by the implementation of the prototype consisting of the AVR UNO board, the sensor devices and MATLAB with the AVR hardware support package. For two or three parameters such as noise, CO and radiation levels, the implementation is tested against normal performance levels or given specifications that provide control over pollution control to make the environment intelligent and environmentally friendly with the environment. The fundamental task of planning and air quality standards is the maintenance of air quality. The level of air pollution can be measured by measuring pollutants such as moisture content, temperature level, dust content, CO content, smoke levels, etc. Air from this area. Here we propose an air quality monitoring system that allows us to monitor and check the air quality in certain areas through the IoT. With a fast-growing technology, it would be good to know our environmental parameters in this broad-based Internet environment, with easy access to the rarest and most distant information. This project is based on IoT (Internet of Things), an emerging field where all devices are connected to a self-created channel (private channel). The channel is used to display the weather parameters with the unique API key of a particular user channel. Each channel has read and write API keys to gain access. The Wi-Fi module, temperature, humidity, gas and dust sensors are connected to the Xmega 2560. The user is prompted for the API key of the channel. ESP8266-01 reads the key and sends it to the Xmega 2560. If the key matches, data transfer between the channel and the microcontroller can occur. The module is connected to Wi-Fi via some AT commands.**

***Index Terms*— Xmega, Xbee Nodes,**

I. Introduction

Control and monitor the various activities that focus on current technological innovations. To reach human needs, they are increasingly appearing. The bulk of this technology focuses on the efficient monitoring and control of various activities. An efficient environmental monitoring system is required to monitor and evaluate the conditions in case the prescribed parameter level is exceeded (eg. noise, CO and radiation levels). In this case, in an environment where an object is equipped with sensor devices, the microcontroller and multiple software applications become an environment of self-control and self-defensive self-control, and are also referred to as an intelligent environment. In this environment, when the LED warns automatically or an alarm event occurs. The Intelligent Environmental Monitoring System monitors and controls the environmental changes in animals, plants and humans due to the effects of environmental change. By using built-in intelligence in the environment, the environment is interactive with other targets, which is one of the applications targeted by smart environments. Human needs require different types of monitoring systems, depending on the type of data collected by the sensing devices. The recognition based on event recognition and the spatial process estimation are the two categories for which the applications are classified. First, sensor devices in the environment are implemented to detect parameters (eg, noise, CO and radiation levels, etc.) while data acquisition, calculation, and control measures (e.g., with respect to the indicated levels, variations in noise and noise) CO levels). To predict the behavior of a particular region of interest and collect the data, the sensor devices are placed in different locations. The main objective of this document is to design and implement an adequate monitoring system that will remotely monitor the necessary parameters and store the data collected by the sensors in the cloud and in the browser. Web to project the estimate.

II. Existing System

In today's world, many environmental protection systems are designed considering various environmental parameters. The existing system model is uses Zigbee wireless sensor networks to monitor physical and environmental conditions with thousands of applications in different areas. The sensor nodes communicate directly with the mobile nodes used in the object of interest, avoiding the use of complex routing algorithms, but

the local computations are very minimal. RFID is a means of storing and retrieving data through electromagnetic transmission to an RF compatible integrated circuit. It is mainly used to track and label items in supermarkets and factories. RFID systems consist of two main components: labels and readers. A tag has a unique identification number (ID) and memory used to store additional data, such as the manufacturer, the nature of the product, and environmental factors such as temperature, humidity, etc. Through wireless communication, the reader can write the data to the tags, to enable identification or tracking, tags are integrated in a typical RFID application or attached to objects. RFID tags can be grouped into three main categories based on their power source: Active tags, passive tags, and semi-passive (semi-active) tags are integrated into or attached to objects of a typical RFID application.

Mobile phones or smartphones are equipped with protective functions and are equipped with sensors for the influence on social networks, including the use of mobile devices to protect the environment, to recognize and influence information to create time, movements and actions that respect the environment. The mobile phone sensors have been implemented and used in urban areas for monitoring and have been divided into two main classes, participatory detection in which the user is directly involved and opportunistic detection in which the user is not involved, but its limitation involves the processing of static information and mobility restrictions. A wireless sensor network with many wireless sensors that are economical, capable of collecting, storing and processing environmental information and communicating with nodes that are neighbors. Previously, the sensors are connected by cables. The access method of the WSN gateway node is convenient because the data from a WSN can be received anytime, anywhere through the gateway. The gateway is responsible for node authentication, message buffering, and acts as a network coordinator where you can collect, process, analyze, and present your metrics. The wireless sensor network management model consists of the terminal, the router, the gateway node, and the management monitoring center. Therefore, in order to collect data from the wireless sensor network and forward it to the master node, the terminal is reliable, then the data is sent from the master node directly or through the router to the gateway node. The gateway node extracts data after receiving data from the wireless sensor network, then analyses it and packs it into Ethernet format data, sending it to the server. A server is an occurrence of a computer program. Which is used to accept and respond to another program request; referred to as a customer. So we can say that any device can be considered a server to run the server software. Servers are used to manage network resources. On servers, services or information are provided over the Internet, connected via LAN, and made available to users through smartphones, web browsers, or other web browser devices, making the system more intelligent, adaptive, and efficient.

III. Proposed System

CO levels in the atmosphere to make the environment intelligent or interactive with objects through wireless communication. Which is inherently more adaptive and distributive to monitor environmental parameters. The proposed architecture will be discussed in a four-stage model, with the functions of each module designed to monitor noise and air pollution. The proposed model consists of 4 levels. Level 1 is the environment, level 2 sensor devices, sensor data acquisition and decision making in level 3, and the level 4 intelligent environment.

Level 1 provides information about the parameters in the region that are monitored to control noise and air pollution. Level 2 deals with sensor devices having suitable properties and properties, and each of these sensor devices is operated and controlled according to their sensitivity and detection range. Between Level 2 and Level 3, the necessary detection and control actions are performed according to the conditions such as threshold setting, detection frequency, messages (alarm or buzzer), etc. Based on the data analysis between Level 2 and Level 3, as well as from previous experience, parameter thresholds are determined in critical situations or normal working conditions. Level 3 describes the collection of data from the sensor devices and includes decision making. These specify the condition in which the data stands for which parameter. In the proposed model, Level 4 deals with the smart environment. This means that it identifies the variations in the sensor data and adjusts the threshold based on the identified CO or noise level. At this level, the discovered data is processed, stored in the cloud, in Google's spreadsheets, and they become a trend of Parameters detected in relation to the specified values. End users can browse the data using cell phones, PCs, and so on.

Based on the framework we have identified a suitable implementation model consisting of different acquisition devices and other modules. In this implementation model, we use the AVR UNO board with Wi-Fi module as an integrated device for detecting and storing data in the cloud. The AVR UNO card consists of analog input pins (A0-A5), digital output pins (D0D13), integrated ADC and Wi-Fi module that connects the integrated device to the Internet. The sensors are connected to the AVR-UNO board for monitoring, the ADC converts the sensor value according to its digital value, and from this value the corresponding environmental parameter is evaluated. The Wi-Fi connection must be established to transmit sensor data to the end user and send it to the cloud storage for future use. Before the captured data is sent to the cloud, the data is processed in MATLAB to analyze and visualize the data for the end user. Analyzing the data in MATLAB allows us to set a threshold and take the necessary control measures.

The integrated device is placed in a specific area for testing purposes. The sound sensor detects the intensity of sound in this area and the carbon monoxide (CO) sensor MQ-9 absorbs the air Quality in this range, when the threshold is exceeded, the

corresponding control action is executed (e g, issuing an alarm message or a buzzer or flashing LED). All sensor devices are connected to the Internet via the Wi-Fi module.

The integrated system with its components for reading and storing the pollutant parameters in the cloud. Upon successful completion of the discovery, the data is processed and stored in the database for later reference. Upon completion of the analysis in the data, the thresholds are set to control the purpose. CO concentrations in the air at regular intervals. All of the above information is stored in the cloud, so we can deliver trends in noise intensity and CO concentration in any given area at any time. After collecting data from various sensing devices, they are placed in a particular area of interest. The detected data is automatically sent to the web server. The connection is made with the server device. The web server page that allows us to monitor and control the system. If you enter the IP address of the server that is being monitored, we will get the corresponding web page. The website provides information on the intensity of sound and variations in CO concentration in the region where the integrated monitoring system is located. The discovered data is stored in the cloud. The data stored in the cloud can be used for the analysis of the parameter .All of the above information is stored in the cloud, so we can deliver trends in noise intensity and CO concentration in any given area at any time.

A. Advantages

1. Connect any number of sensors to know the exact contents of any gases present in the air.
2. Detection of a wide range of gases, including CO, MH4, alcohol, smoke, etc.
3. Simple, compact and easy to handle.
4. The sensors have a long life and lower costs.
5. Simple driver circuit.
6. The system is in real time. • Operating voltage: 5 volts, -20 ° C to + 50 ° C
7. The quality of the air can be checked both internally and externally.
8. Visual output.
9. Continuous updating of the change in the quality share.

IV. Conclusion

This system enables all the citizens of the country to give his/her vote over the internet and avoid proxy vote or double voting and provide highly secure, quick to access and easy to maintain all information of voting, highly efficient and reliable due to the use of fingerprint scanner it reduce or remove unwanted human error. In addition, this voting system is capable of handling multiple modules in various centers and provide better scalability for large election.

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