

IOT BASED AIR AND SOUND POLLUTION MONITORING SYSTEM

¹Anant Vatta, ²Arjun Khurana, ³Nihir Sharma, ⁴Muthamil Selvan

^{1,2,3}Student, ⁴Asst. Professor

^{1,2,3,4}Department of Computer Science,

^{1,2,3,4}SRM Institute of Science and Technology, Chennai, India

Abstract : Air and sound pollution is a prevailing issue these days in most of the cities. It makes the monitoring and control of air and sound pollution necessary in order to provide a healthy and safe living environment for the people. Here, we propose an air and sound pollution monitoring system that enables us to monitor current air quality and sound pollution in particular areas easily by the use of IOT. Our system uses air and sound sensors to sense the air quality and sound levels and constantly transmit this data to the microcontroller. This will allow authorities to monitor air pollution in different areas and take action against it. Also, authorities will be able to keep a watch on the noise pollution near No Honking Areas, and the system will alert them if the levels of pollution exceed.

IndexTerms - IOT, Air Sensor, Sound Sensor, ESP8266

I. INTRODUCTION

The devices connected to the internet and sometimes the devices that can be controlled from the internet is called the Internet of Things. In our system, the pollution monitoring systems are connected to the internet to get real-time data sensed by the sensors. Due to the rapid growth in the industries and vehicles in the recent years, there has been a simultaneous increase in the air and sound pollution in the cities. So a proper Air and Sound pollution monitoring system is required in order to efficiently manage the pollution and to properly plan the growth of the cities. Our system is made up by connecting the Air and Sound sensors with a microcontroller, which uses a Wi-Fi module to transmit the data to the server. With our system, we are proposing an efficient, remote way to monitor the air and sound pollution which will help the responsible authorities to take a suitable action as per the requirement.

II. WORKING & EXPLANATION

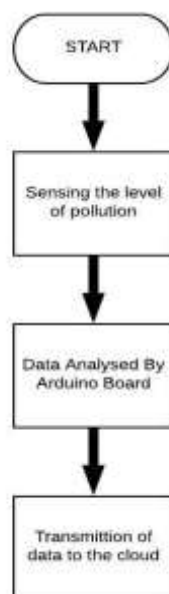


Figure1 Flowchart

We are going to make an IOT based Air and Sound pollution monitoring system which will let us know about the instantaneous pollution status in the particular location where the system is designed by transmitting data over the Internet. We have decided to make the system by using sensors which will make it very much cheaper and efficient in applications. It will be very useful and can be installed in locations that are heavy air and sound pollution causing zones like Airports, Industrial zones and roads with heavy traffic flow. This system will reduce a lot of human effort and time and can efficiently send the data to the concerned authorities which will be able to take certain necessary actions as per requirements based on the monitored data.

III. SYSTEM ARCHITECTURE

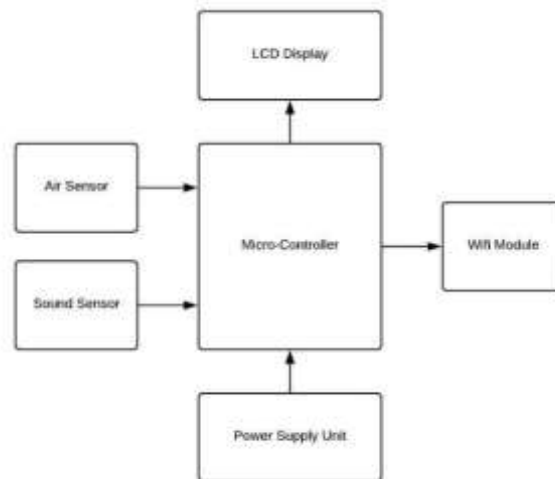


Figure 2 System Architecture

A. ARDUINO UNO

The Arduino UNO is an open-source microcontroller board. The board is equipped with sets of digital and analogue input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. It is programmable with the Arduino IDE. We can power it up by a USB cable or by an external 9-volt battery.

B. ESP8266 WI-FI MODULE

The ESP8266 is a low-cost Wi-Fi microchip. This small microchip module allows microcontrollers to connect to a Wi-Fi network. In this system, the module will send the data to the cloud servers.

C. MQ135 AIR SENSOR

The MQ135 is a cheap air sensor with fast response and high sensitivity with a long life range. In this system, the sensor will send its data to the Arduino board which will send the data to online servers with the help of the ESP8266 Wi-Fi Module.

D. GROVE SOUND SENSOR

The Grove Sound Sensor can detect the sound intensity in its environment. The main module of this sensor is a simple microphone based in the LM386 amplifier and an electret microphone. In our system, this module will be sending analogue outputs based on the intensity of sound to the Arduino board which will be further sending the output to online servers using ESP8266 Wi-Fi module.

IV. IMPLEMENTATION

The Block Diagram shows the various components used in the system to transmit data over the Internet. The modules can be divided into two groups according to their functions. The sensors section and the Wi-Fi module (ESP8266) section. The modules are attached to the Arduino board.

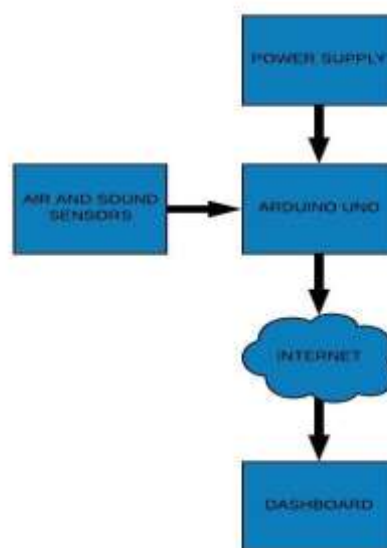


Figure 3 Block Diagram

The Air and Sound sensors are used to detect the Air and Sound pollution and send the data to the Arduino. Wi-Fi module helps in sending the sensed data to the Dashboard through the Internet. Figure 3 shows the block diagram of the working of the system.

The sensors transmit the data to the Arduino, which further transmits the data further to the internet by using the ESP8266 Wi-Fi module. Therefore, the system transmits the data continuously to the online dashboard.

V. RESULT

The following results are obtained from this work,

- Air and Sound pollution detection in the systems environment.
- Real-Time data transmission and access.

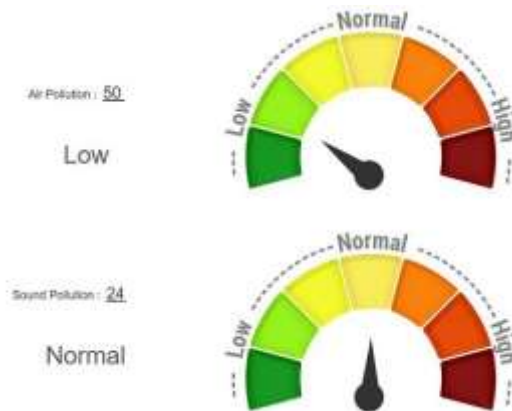


Figure 4 Sample Dashboard Output

The Data sent to the internet is depicted in the form of Pie-Charts as well as the actual values of the intensity of the air and sound pollution intensity.

VI. CONCLUSION

This project work is the implementation of an IoT based Air and Sound Pollution Monitoring system using MQ135, Grove Sound Sensor, ESP8266 Wi-Fi module and Arduino Uno. This system provides the Air and Sound quality of the location of installation to the respective authorities. It removes the requirement of any physical effort to do the measurements and provides the data remotely. It will help in better plan making by the authorities in reducing the pollution and in making a better place to live for the people.

VII. REFERENCES

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