

## **IOT BASED NOISE POLLUTION MONITORING SYSTEM**

### **1. Problem statement understanding:**

- Noise pollution is a growing issue these days. Here we propose a noise pollution monitoring system that allows us to monitor and check noise pollution in a particular areas through IOT.
  - Also system keeps measuring sound level and reports it to the online server over IOT. The sensors interact with microcontroller which processes this data and transmits it over internet.
  - Authorities can keep a watch on the noise pollution near schools, hospitals and no honking areas, and if system detects noise issues it alerts authorities so they can take measures to control the issue.
  - Residential noise is a leading cause of neighborhood dissatisfaction but is difficult to quantify for it varies in intensity and spectra over time.
  - Residential noise is modeled as an ambient background punctuated by transient events. The quantitative noise model extracts noise features that are sent as SMS text messages.
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- The Noise Pollution Monitoring System consists of the Arduino Uno which is based on ATmega328 microcontroller. Arduino is also known as the mind of the device.
  - The sound sensor is connected to one of the pin.
  - This sensor provide the data to the Arduino that is displayed on the LCD display continuously, LCD Display is connected to the arduino board and if the noise pollution exceeds the set limit (defined by the programmer) then the output is shown in the analog form i.e. if the noise pollution is raised above 90dB then it will be displayed on the output pane and LED will start blinking
  - Now the data which is retrieved sound sensor will be provided to the wifi module. which is connected on the Arduino board.

- This wifi module (nRF24L01 module) will then provide this data to the android application accessible to all the android phone users and accordingly the local people can take actions on their part.
- A sound sensor module mic is used to capture sound.
- The sensor interact with arduino which processes this data and then transmit it over the mobile application. To send the data over remote location a mobile application should be developed.
- And whenever noise pollution is detected an LED will start blinking continuously.
- With this system not only the authorities but also the localized people can check the transmitted data through their mobile phone and that too without spending single penny and the people can act against it on their level and try to bring the pollution level under control This system would contribute as a part in the building of a healthy society.

## **2. Software and Hardware requirement:**

- a. Will require a mobile/web application to monitor the system.
- b. Softwares used - PHP, HTML ,CSS ,Js, Mysql,Proteus software .
- c. For hardware:- Sound Sensor , Arduino , LCD display , LEDs , Wifi Module
- d. Sound Sensor measures the sound in dB the first from 45-80 dB and the second from 65-110 dB.

## **3. Additions/ Updates:**

- a. We can make such a system where the if a particular household/institution exceeds the level of noise they can be charged on monthly basis. This should be inbuilt in the building meters.

#### **4. Applications:**

- a. The system can be used in places of parties / get-togethers making them keep the noise levels within a certain limit so that there's no issue to nearby residences.
- b. The system can be used as a baby monitoring system .
- c. It can be used in a vehicle to avoid unnecessary honk.
- d. Challenges would be : It should avoid small intensity noises (basically caused due to some interference in the surrounding). There should be minimum component noise.

#### **5. Conclusion:**

- a. This IOT based noise pollution monitoring device is a great step towards a healthy livelihood.
- b. With the help of this device not only the municipal authorities but even the common people can participate in the process of controlling pollution and ensure safe environment.
- c. This automatic device, once installed is capable of continuously tracking the pollution level and analyse the detected information.
- d. The most highlighting feature of this device is that the output is represented in digital as well as analog format with the help of a simple mobile application which is usable on all android devices like smart phones, tablets, PDA's etc.

#### **6. References:**

- a. <https://youtu.be/63sb-KgFQ-4>
- b. [https://www.researchgate.net/publication/342277528\\_IOT\\_BASED\\_AIR\\_AND\\_SOUND\\_POLLUTION\\_MONITORING\\_SYSTEM-A\\_REVIEW](https://www.researchgate.net/publication/342277528_IOT_BASED_AIR_AND_SOUND_POLLUTION_MONITORING_SYSTEM-A_REVIEW)
- c. <https://www.seeedstudio.com/blog/2020/01/03/what-is-a-sound-sensor-use-s-arduino-guide-projects/#:~:text=A%20sound%20sensor%20is%20defined,converting%20it%20to%20electrical%20signals.>
- d. <https://www.slideshare.net/irjetjournal/irjet-iot-based-air-and-sound-pollution-monitoring-system>

