Abstract

In near decades, the engineering and science professions have been hugely influenced by their responsibilities to the people. These responsibilities have send towards the protection of public welfare and healthcare. In the controls for emission of pollutants, engineers and scientists have created strategies for monitoring the environmental pollution problems. Environmental monitoring describes the activities and processes that should take place to monitor the quality of the environment. All strategies and techniques have justification and reasons which are often created to establish the status of an environment or to establish environmental parameter. In this paper, we have proposed an idea to monitor noise pollution using IoT Technique. The area covered by which the environment gets affected is noted and control and prevention practice is implemented. By controlling the environmental noise pollution the cities are deprived of health issues.

Keywords: IoT, Noise Pollution, Arduino, Sound Sensor

INTRODUCTION

According to a WHO report half of India live in noisy surroundings and one third of Indians experience sleep disturbances due to traffic noise. One fifth of Indians are regularly exposed to sound levels at night that could significantly damage health. There should be a system which shall quantity the noise coming from railways, major airports, highways and other sources of noise. Noise maps are based on numerical calculations and having display to give good measures of long term averaged noise level. However, these maps does not take into account the variation of the noise levels, temporary construction work, emergency vehicles, squeak from hanging brakes on

trains etc [1]. Automatic environmental noise monitoring has been around for many years, but it is in use since last few years. There are several reasons for using such system like communication become faster, cheaper and more reliable. Automated noise monitoring system with real time access to noise data should be implemented for measuring noise level and for taking actions accordingly.

ENVIRONMENTAL NOISE ASSESSMENT

Nowadays measurements of environmental noise in urban areas are only carried out by officials who collect data at different set of locations e.g. railways, airports and industrial estates by setting up noise level meters during a short span of time.

Broadcasting models are then used to generate noise maps by extrapolating local measurements to wider areas. This practice has limitations, notably regarding the requirements of the Indian Noise Directive [4]. Spatio-temporal data graininess, computational models frequently produce results with an undetectable error margin, which may lead to wrong conclusions. The cost of noise mapping campaigns is high due to need of human resources and expertise, the deployment of expensive noise level meter devices and the processing effort. This restricts cities with limited budgets from conducting such assessments for noise monitoring[4][5].

ALTERNATIVE APPROACH

In past few years we have seen an increasing interest in wireless sensor networks for urban sensing and environmental monitoring. A WSN [2] is network consisting of autonomous devices using sensors to cooperatively monitor parameters like temperature, humidity, pressure, noise pollution conditions at different locations. Wireless sensor networks have the power to revolutionize noise pollution monitoring. Wireless Sensor Network uses large numbers of simple and cheap sensor devices [2]. Sensors are embedded into the environment and operate simultaneously. We can combine this network with the IoT based noise pollution monitoring device. Internet of things mean interrelated device which communicate without the interaction of humans. Using such device we can monitor the level of noise pollution, and after collecting data we can take action accordingly. IoT based noise pollution monitoring device is shown in below figure.

In this IOT device, the equipment can be used are given below:

1) Arduino
2) Sound sensor
3) Open log
4) Groove OLED Display
5) Electric Imp
6) Power from 5v DC to DC setup – 2xAA

The reason we decided to use IoT based device is that there is no need of human

interaction. They are interrelated computing devices and having ability to transfer data over network without human-machine interaction. The reason for using arduino micro controller[6] is, it consist of both physical and programmable circuit and piece of software. In this device circuit board is programmed to monitor the noise pollution, which is done using the sound sensor which can collect data of noise level and then data is stored locally in memory card attached in this device. Display can also be attached to device so that we can check data and analyze it. Data is also stored on particular server using electric imp. Electric imp is very powerful for the IOT devices to connect with network. In electric imp code libraries already exists to send data from imp to services.

ADVANTAGES AND DISADVANTAGES

Advantages: IoT[7] based noise pollution monitoring system is a machine to machine communication system so data to be recorded will have great accuracy. Also devices are wirelessly connected so automation and controlling of it becomes an easy task for a person. It can record data without any human interaction. This system saves good amount of time because once it is installed, it works automatically. we just have to read the data and analyze it. Most of the current noise pollution recording devices are costly compared to the IoT based devices, they are cheap so they will save good amount of money also.

Disadvantages: As this devices are interconnected via internet there are possibilities that they can get hacked or monitored by malicious users or can be tracked by other systems as well. So the security of the recorded data can be an issue using this type of devices.

APPLICATION OF IOT BASED NOISE POLLUTION MONITORING · We can use it at industrial area as there is lot of noise pollution. · In city roads traffic noise

· Activities like shooting, open air events, football and cricket matches. · At small level, in schools and colleges we can use this device.

CONCLUTION

Noise pollution has become one of the major problem for Indian citizens which also affects health of the inhabitants. So the system should be developed to major the amount of noise level and accordingly actions should be taken. In this paper one approach for IoT based noise pollution monitoring system is presented. The noise pollution monitoring system is basically making use of Arduino controller to record and process data and sound sensor to major amount of noise. For monitoring noise pollution of industrial zones and cities this model can be further expanded. Implementation of this model can provide well-organized and low cost solution for real time monitoring of environmental noise.

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