Internship title-:Tinkerer LAB Electronics internship

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IoT based noise pollution monitoring system

Introduction: Presently, noise pollution has become a very big issue around the world. The adverse effects of this pollution include hearing impairment, negative social behavior, annoyance, sleep

disturbance and intelligibility to understand people's speech. In learning context, noise can affect understanding and behavior of people and places with high noise level are not suitable for learning and teaching process.
Internet of Things **(IoT)** technology is one of the best choices to monitor the noise or sound intensity in the environment for the safety of human being[1].

Problem Statement Understanding :

While at university students are exposed to various types of noise including external, environmental noise and noise generated within the classroom.

Earlier researches have shown that sound-pollution has detrimental effects upon student's performance at university, including reduced memory, motivation, and learning capability. The noise impact on student and their lecturers have been inspected by researchers in the past 40 years. It is generally accepted that noise has a detrimental effect upon the cognitive development of students.

Noise pollution is the inordinate noise measure or pesky sounds that unsettle students and distracting them in the lecture halls and workplaces. This kind of pollution has different effects on students' health, physically and psychologically . Main sources of noise pollution inside campus are high volumes of outside traffic and human-based sounds.

In classrooms, the noise levels are equal to residential environments and accepted are those which not exceed 65 dBA

during the day . Accepted standards for recommended permissible exposure time for continuous time weighted average noise, stated that for every 3 dBA over 85 dBA, the permissible exposure time before possible damage can occur is cut in half, e.g., 85 dBA is linked with a permissible exposure time of 8 h; 88 dBA for 4 h, 91 dBA for 2 h .The use of percentile levels in the acoustic analysis helps to have an understanding of the noise fluctuations over time.

These are commonly used for environmental

noise monitoring, such as road traffic community noise assessments. With the use of long-term

measurements, changes on the levels can be observed from the data, and more advanced studies can be performed in order to evaluate the noise volume.

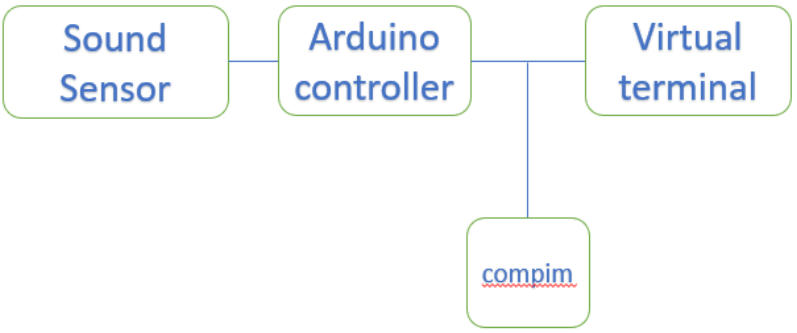
Monitoring these sources of noise pollution is crucial for the comprehension of how these sounds evolve with time, in order to study it, control it and prevent it[2].

Proposed solution:-

A solution for monitoring the noise and CO levels i.e., any parameter value crossing its threshold value ranges, for example CO levels in air in a particular area exceeding the normal levels etc., in the environment using wireless embedded computing system is proposed in this paper. The solution also provides an intelligent remote monitoring for a particular area of interest. In this paper i also describe a trending results of sensed or collected data with

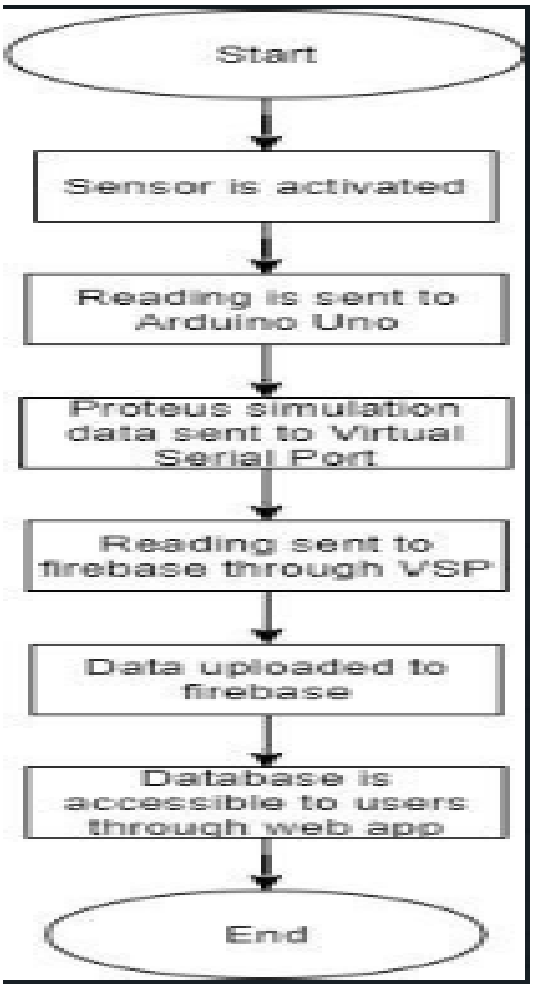
respect to the ordinary as well as specified ranges of particular parameters. The embedded system enables the user to remotely access the various parameters and store the data in cloud and This system is an integration of sensor devices with wireless communication. The quality of air is important for the survival of living beings. It is necessary to monitor air quality and keep it under control for a better future and healthy living for all. The basic mission of this project is to preserve and improve the quality of air. Compared to natural sources, man's activities produce a much smaller amount of global pollution. Any substantial change in the nature or contents of the atmosphere has a direct consequence on how well the atmosphere performs these tasks. Atmospheric problems are made worse by weather conditions, so we should know about it correctly. we propose an air quality pollution monitoring system that allows us to monitor and check live air quality in a particular area through IoT. The sensors interact with microcontroller which processes this data and transmits it over internet. This allows authorities to monitor air pollution in different areas and take action to control the issue. Here we propose an air quality pollution monitoring system that allows us to monitor and check live air quality in particular areas through IoT. To sense presence of harmful gases/compounds in the air and constantly transmit this data to microcontroller; Air sensors are used by the system. The interaction of sensors with microcontroller processes this data as well as transmits it over internet.

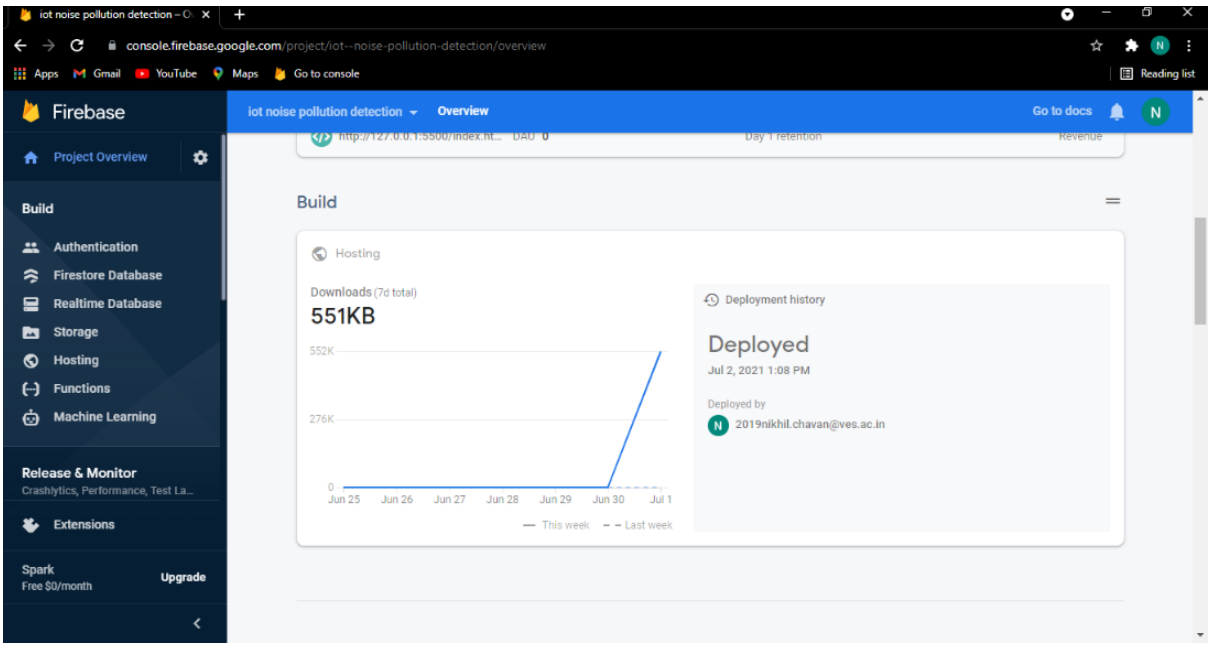
Block diagram



FLOWCHART:-

RESULT:-

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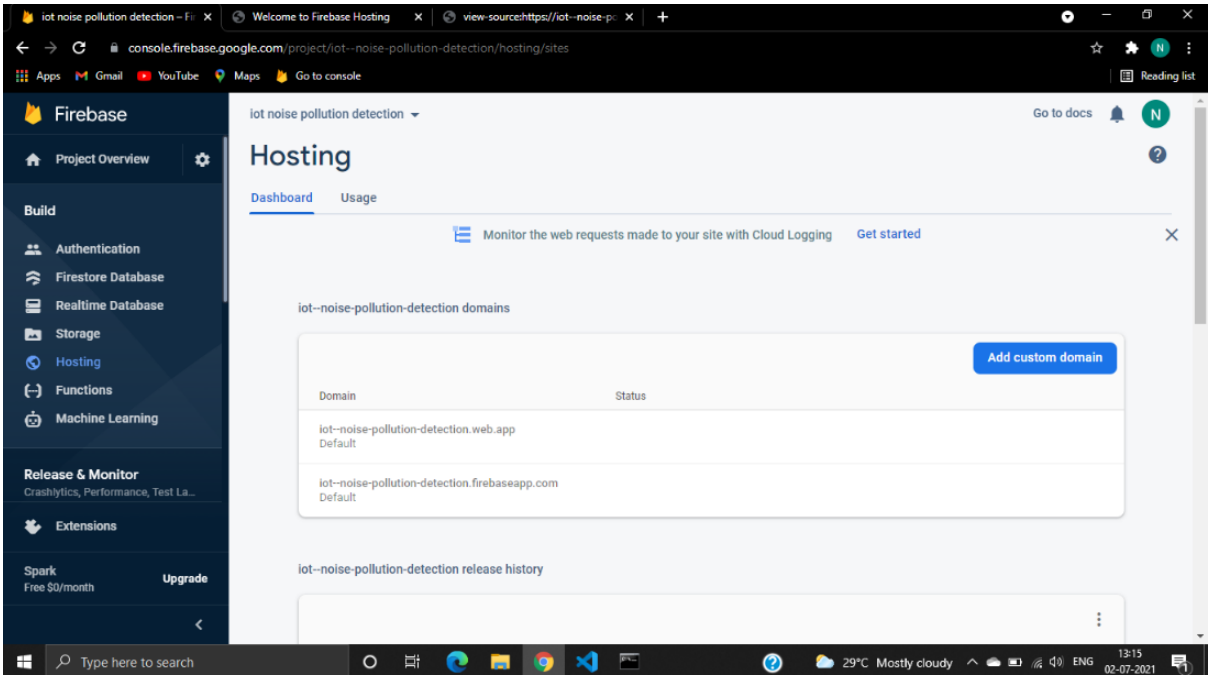
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Add custom domain
Domain
Status
iot--noise-pollution-detection.web.app
Default
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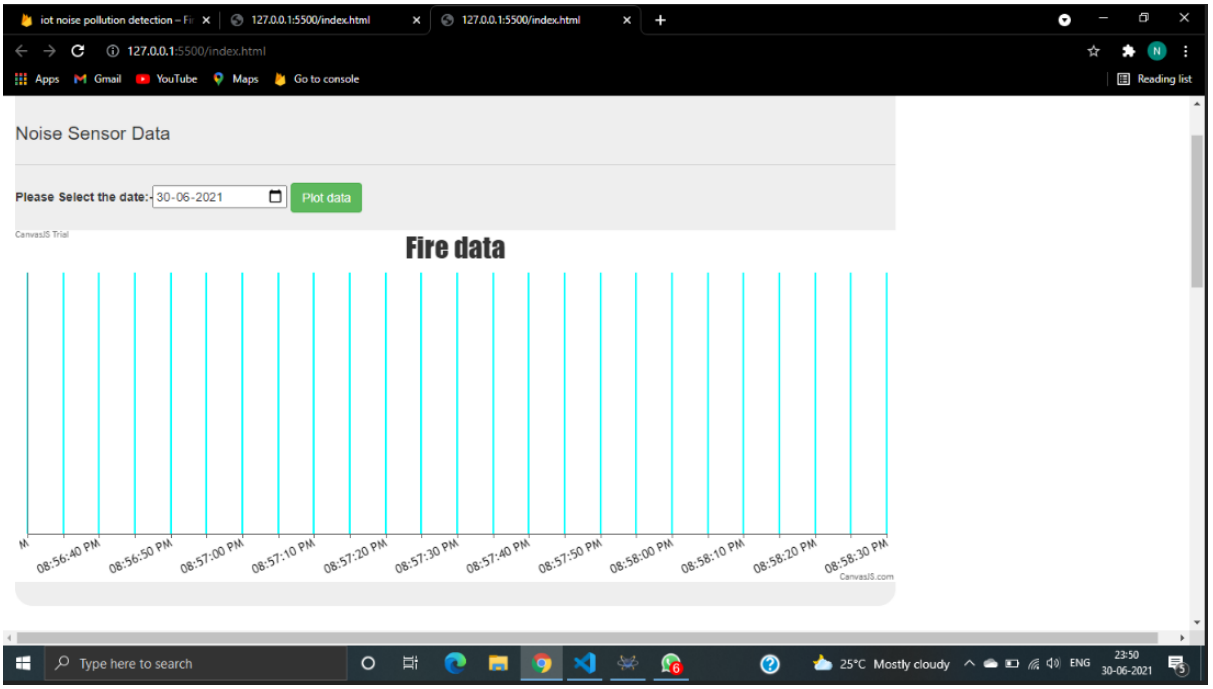

Link of the deployed webapp:-

https://iot--noise-pollution-detection.firebaseapp.com/

Advantages:

· Remotely we can Monitor Pollution.
· Cheap In Cost.
· Data can be used to control pollution.
· Small in size.
· Data is useful for government Health departments.[3]

Applications:-

- Industrial pollution monitoring.
- Public places.
- School area.
- Environmental Section.
- Installed in Vehicles.

Learning outcomes:-

By doing this tinkerer lab electronics internship,I have learned basic programming of Arduino controller,python programming. I understood

The basics of firebase and now I know how to send data to google firebase using python. I leran front end development of website using HTML,CSS and JAVASCRIPT. I learned to create realtime database. I also learned basic machiene lerning and I also created one simple prediction model using ML .

Conclusion:-

People thought that noise pollution is merely an annoyance but it is actually very important to monitor noise level because according to research, people who are exposed to noise for a long duration of time can have hearing loss, sleep disturbance, high blood pressure and injuries[1].

The article explains the basic blocks and components used in this system. It's a complete case study for the proposed system design. The system is very much helpful for real time sound pollution

monitoring. The System can be applied at remote areas and can be used to control pollution. The proposed system is cheaper in cost and smaller in size and it can be applied in industries as well as public sectors.

So this research proposes a smart noise monitoring system which keeps track of quality/range of noise and continuously giving updates on our device

Reference:-

[1] M B Badruddin , S Z A Hamid ,R A Rashid &S N M Hamsani "IoT Based Noise Monitoring System (NOMOS)" Sustainable and Integrated Engineering International Conference 2019 (SIE 2019)

[2] Aram Mohammad Abdulqadir & Mohammed Hussein Shukur "Development of an IoT-based Noise Monitoring Network" Cihan University-Erbil Scientific Journal Special Issue No.1, July 2017

[3] Prof. Kaushik Vipul R., Dr. Tanaji Dabade, Dr. Vijay N. Patil "IOT BASED AIR AND SOUND POLLUTION MONITORING" SYSTEM- A REVIEW **© 2019 JETIR June 2019, Volume 6, Issue 6 www.jetir.org (ISSN-2349-5162)**

Appendix:-

a)source code web app:-

https://github.com/Tinkerers-Lab-VESIT-ETRX/IoT-based-noise-pollution-monitoring-system-10/blob/main/index.html

b)Source code of Arduino:-

https://github.com/Tinkerers-Lab-VESIT-ETRX/IoT-based-noise-pollution-monitoring-system-10/commit/101777748d0c06c364f5858b7f0ff4e165695529

c) Source code of python data uploaded

https://github.com/Tinkerers-Lab-VESIT-ETRX/IoT-based-noise-pollution-monitoring-system-10/commit/4c0a350d754c65ec0c069c7923b49e8a371d07d4