iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** XII **Month of publication:** December 2020

DOI: https://doi.org/10.22214/ijraset.2020.32570

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue XII Dec 2020- Available at www.ijraset.com

Sound Pollution Detector in the Sensitive Areas

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***Abstract:** In this project, a sound sensor has been utilized to detect sound of loud voices, sound of cars in chaotic places and other mechanical sources etc. The controlling of output visual alarms using different sound levels are developed. So, the loudness can be understood of coming voice signals by seeing the number of output indicators in this process. This is well-known that excessive noise can cause a health problem ranging from stress, poor concentration, hearing problem etc. So as a human being it is our duty to control the noise pollution. Besides that, it is very harmful being surrounded with more sound at sensitive areas. So, for the implementation of the project it can be placed in a chaotic place to detect sound at sensitive areas such as hospitals, school and collage areas etc. and also can control excess sound as required.*

I. INTRODUCTION

In this project effort the novel idea is to generate power or energy from the cumulative power of noise generated near any chaotic place such as any four way crossing, factory, station area, airport ground etc. Different types of noisy sounds are Industrial noise, Aircraft noise, Train noise, Ambient noise, Shooting place near army training camp and environmental noise, loud music, jet noise, roadway noise, traffic noise etc. Noise is basically mixture of different types of sounds. CZN-15E sound sensor is a Microphone module based sensor which can detect sound intensities using an adjustable potentiometer to adjust the trigger level of the internal circuitry. The form of the output is binary i.e the output goes high if sound intensity level crosses preset trigger level. According to the sound level, controlling using Arduino Uno interfacing board is implemented.

II. METHODOLOGY

In this project, it is planned as shown in the to utilize the energy source signal which can be given in the form such as noise pollution from a chaotic place or any other sound generated due to the mechanical movement of the machineries in different industries etc. The noisy signal acquired from the mentioned sources is being converted into an electrical signal is used for further processing. This electrical signal is passed through a signal conditioning unit for being amplified and filtered to get proper workable signal. After the processing of the proper conditioned signal it is stored to achieve a continuous power supply from a non-conventional energy source.

The required components are mentioned below:

A. Sound sensor IC
B. Arduino Uno
C. Breadboard
D. Single stranded wire
E. LED

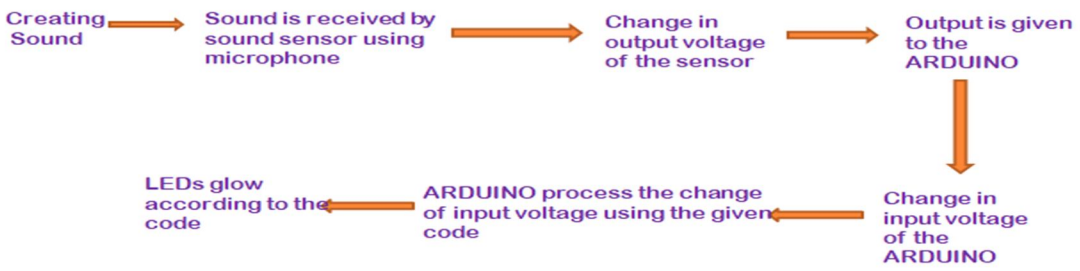

Fig. 1: Block Diagram of the Proposed Project work

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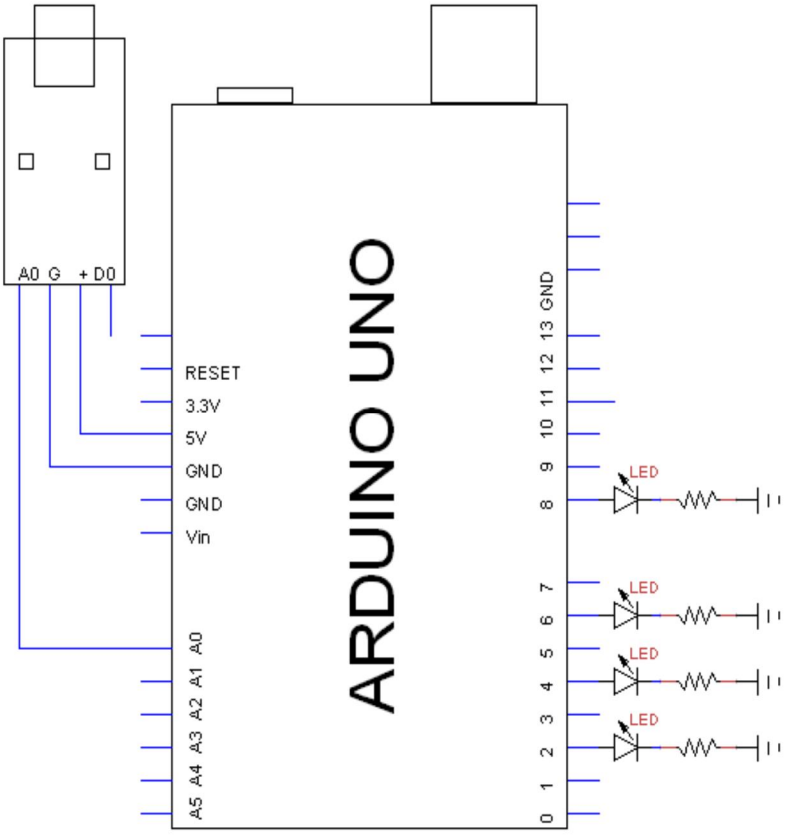

Fig. 2: Circuit Diagram of the Sound level detection

III. RESULTS AND DISCUSSIONS

Table 1: Obtained Sound Intensity at different places

SL. No.	Place	Sound Intensity level (millivolt)	Output Voltage Level (volt)
1	Station area	0.2	1.78
2	Factory area	0.15	1.74
3	Four way crossing road	0.10	1.4

TABLE 2: Output Voltage, Power and Loudness according to change in Sound Intensity

Change in dB	Voltage	Power	Loudness
3	1.4X	2X	1.23X
6	2.0	4.0	1.52
10	3.16	10	2.00
20	10	100	4.00

From the above mentioned Table 1 and 2 it can be understood that when sound intensity is more, voltage, power and loudness are changing accordingly with the multiplying factor. So, loudness of coming noise can be detected by seeing the number of LEDs glow in this process. Here the controlling of LEDs using different sound levels. Thus any type of sound pollution can be controlled any electronic device using sound.

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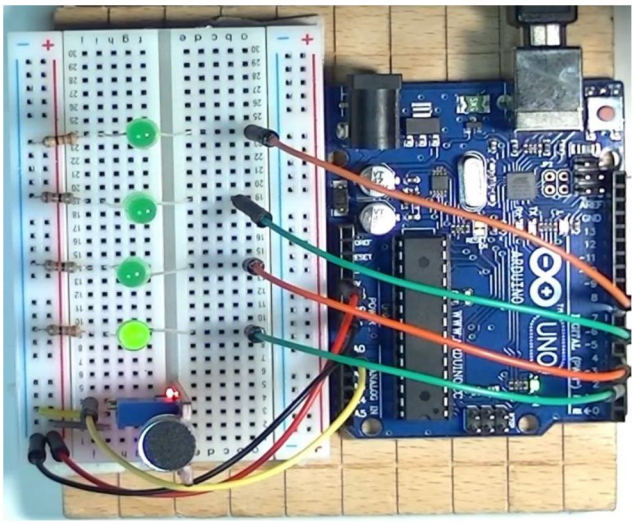

Fig. 3: Snapshot of the Project work

The applications are

A. Sound intensity Detection
B. Security system for Protective places or Home
C. Spy Circuit
D. Home Automation
E. Robotics
F. Smart Phones
G. Ambient sound recognition
H. Audio amplifier
I. Sound level recognition

IV. CONCLUSION

Overall, the hardware circuit and the programming are performed successfully and was functional. However, an improvement can be made to the programming logic by adding a specific condition for the automatic database creation regarding the location tracking of the polluted area. With the technological advancement of the electronic systems and gadgets our daily life has become faster and comfortable. But with those good aspects some loss of energy also occurs in the form of noise pollution which is not desirable for the maintenance of the healthy environment. This innovative work has been reached at a great position to fulfil many purposes near hospital, near educational institution etc. People should not create noise in hospital or school area as more than 60 dB sound is harmful for patients and children. Through this project work it is attempted to use the lost energy for the charging purpose of the electronic gadgets for the betterment of specially traffic and industrial noise management.

V. ACKNOWLEDGEMENT

The authors are expressing their gratitude to Narula Institute of Technology who had given all the support for performing experiments in this regard.

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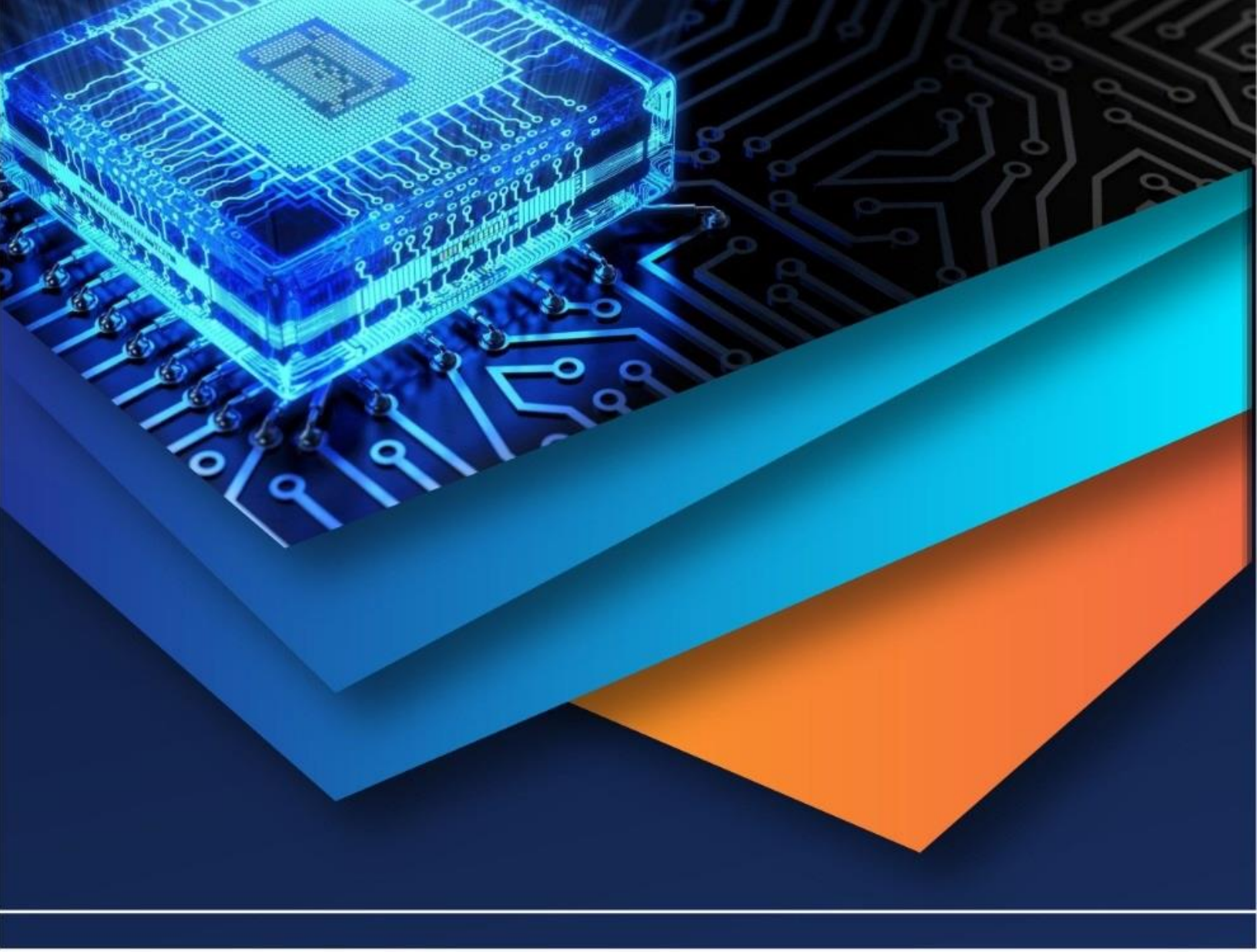

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