Human Activity recognition in a space using low-cost cost sensors

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Shashank Samudralwar – 20EC10074

Himanshu Yadav – 20CE10029

Abhyuday Agrawal - 20MT10002

Vanumu Praneeta -20AG10040

Introduction and significance of the project:

This project will help us to identify the intensity of activities in an office room or a space by using ultrasonic distance sensor, which is used to measure the distance of the target and decibel sensors, which is used to measure the intensity of the sound coming from or made by the target.

Statement of the problem:

These days, the wastage of electricity is not uncommon. By turning off switches, much power can be saved. With the help of this project, we can reduce the energy usage of a workspace by switching off the electrical parts which are not required at that time and also can estimate the space usage.

Procedure and results:

- ➤ 1. Procure an LM393 decibel sensor, an ultrasonic distance sensor, and an Arduino Uno R3.
- ➤ 2.Acquire the knowledge of analog and digital signals, and understand its significance and relevance with respect to each pin on each sensor. Acquire the skill of coding in C++.
- ➤ 3.Create a logic where the readings of each of the sensors are manifested as physical quantities in the real world.
- ➤ 4. Using the modified version of C++, used in Arduino, implement the above formulated logic in the form of a program.
- ➤ 5.Design the relevant circuit in TinkerCAD and replicate that in real life. Next, power the Arduino using a USB cable to the computer with the C++ program. Upload the code.
- ➤ 6.Test the distance and sound sensors. This can be done easily for the ultrasonic distance sensor using a meter stick.
- ➤ 7. Assign the combination of readings a situation such as 'partying', ' working', 'discussion'.

Limitations of the product and solutions:

1.The effect of high frequency waves, such as the 40kHz used in the ultrasonic distance sensor, on the human body is controversial.
 2.We can detect the intensity more accurately if more number of sensors are placed at different positions, but due to lack of sensors we couldn't get the result more accurately.

Conclusion:

With the help of sensors we can detect , if there is high movement and high noise when a party is going on, low movement and high noise when a meeting is going on and low noise when they are working.