COAL: Covid Social Distance Alert System

Nikshep Chatta

Apex Institiute of Technology, Chandigarh University, Gharuan, Punjab, India

ABSTRACT

The coronavirus disease (COVID-19) has brought global crisis with its deadly spread to more than 190 countries, and about 11,60,48,492 confirmed cases along with 25,79,096 deaths globally as of May 6, 2021. Lack of immunity is the major factor that led to an increase in COVID cases globally. While vaccines are available, social distancing is the only viable strategy for combating this pandemic. This article is inspired by this idea and suggests a project that would notify an individual if they fail to maintain a social distance with another person. Maintaining the right gap for social distancing is not always feasible. Whenever we are out, we mostly forget to maintain the distance as soon as we get involved in our daily work. "COAL" will help you if you come too close to someone either from front, back, right, or left direction.

KEYWORDS: COVID-19, Social Distancing, Arduino UNO, Ultrasonic Sensor, LED's, COAL, Neo pixel Ring RGB

INTRODUCTION

The COVID-19 pandemic, which started in Wuhan, China in December 2019, has ushered in a new way of life and a new reality in which social distancing and the wearing of masks have become a necessity for survival. With a global rate of 11,60,48,492 confirmed cases, 21,804,998 active cases, and 2,595,488 deaths, this disease isn't going anywhere anytime soon even if vaccine is accessible and in reach to everyone. As per the Philippines COVID-19 Control people should wear masks and maintain a social distance of one meter between individuals as the virus could spread through saliva and human contact as well, for prevention of COVID-19 infection it can be achieved by imposing social distancing protocols in public places but it is one of the biggest obstacles that local authorities are facing. Thus, I have come up with an idea called COAL which will solve the problems related to social distancing and prevent the spreading of Coronavirus. Thus, I have come up with a prototype called COAL that will solve the problem related to social distancing and prevent the spreading of Coronavirus.

PROPOSED SYSTEM

An ultrasonic sensor, a buzzer, LEDs, and an Arduino are among the components used to make COAL. An ultrasonic sensor then calculates the distance between the person wearing COAL and the other individual (wearing COAL is not required). As a result, it is designed in such a way that as soon as a person violates social distancing protocol COAL will alert them.
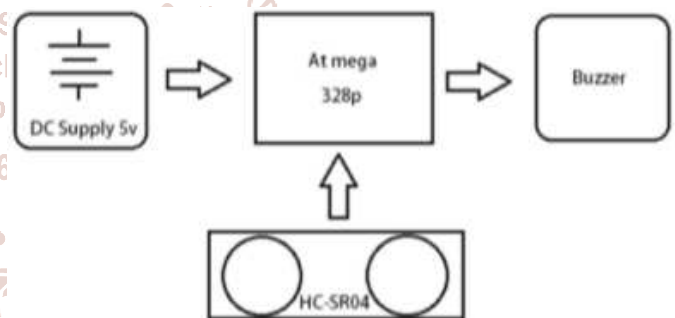

Figure 1: Block Diagram of Proposed System

The Hardware Components which are used in this project are:

A. **Power Bank –** It assists COAL in providing the necessary power for its proper functioning and usage.

B. **Arduino UNO –** It is the heart of the project without it nothing can work. Arduino is a type of microcontroller which is based upon the ATmega328P microcontroller, which has fourteen pins, six of which are used for PWM output.

C. **Buzzer –** It is tiny but one of a very useful component of hardware projects, it is mainly used in hardware projects which are used to generate alert or have alert mechanism involved in it.

D. **Ultrasonic Sensor –** It is a sensor that measures the distance between the device itself and the target object which is done with the help of reflected sound waves into electrical impulses.

E. **LED's –** LED is an acronym for Light-Emitting Diodes, It is a light-emitting source that turns on as soon as current passes through it. Conventionally it has many advantages over an incandescent light source like low energy consumption, smaller in size, long-life, etc.

WORKING OF PROPOSED SYSTEM

In these tough times of deadly pandemic of Coronavirus, we ought to maintain social distancing of at least 1.5-2.0 meters from the people and in public places which might help in breaking this chain of peak spikes in the number of cases being registered daily. But nowadays people are casually taking these protocols whether it is people supporting politicians in the rallies or people protesting against farm laws or going for a bath in Kumbh Mela people have ruined social distancing protocols, due to which there is a humungous spike of these cases. So, to avoid violation of social distancing protocols, I have come up with an idea called COAL which might not stop COVID but help in slowing down the speed of spread of this disease. In COAL the ultrasonic sensor measures the distance between the COAL wearer and the target object via ultrasonic waves, which are then transformed into electrical impulses, and later on when these signals which were measured by the ultrasonic sensor are then sent to the Arduino for further processing. The code which when deployed on the Arduino will work if the conditions on the code are met that is when the distance is less than 2.0 meters it goes true and the electric buzzer or the LED starts working and starts alerting you to maintain social distancing.

SERIAL MONITOR

Here are the conditions which are supposed to be achieved by the COAL for its smooth functioning:

1. If the COAL wearer is at a distance of fewer than 2.0m from the other buzzer or LED will start working and won't stop until the sensor range is not greater than equal to 2.0m I can say until and unless social distancing is being maintained it won't disturb but as soon as COAL sees you violating the law it will alert you.

2. If the COAL wearer is at a distance greater than 2.0m then it would be safe per the code and so the buzzer or the LED will not work.
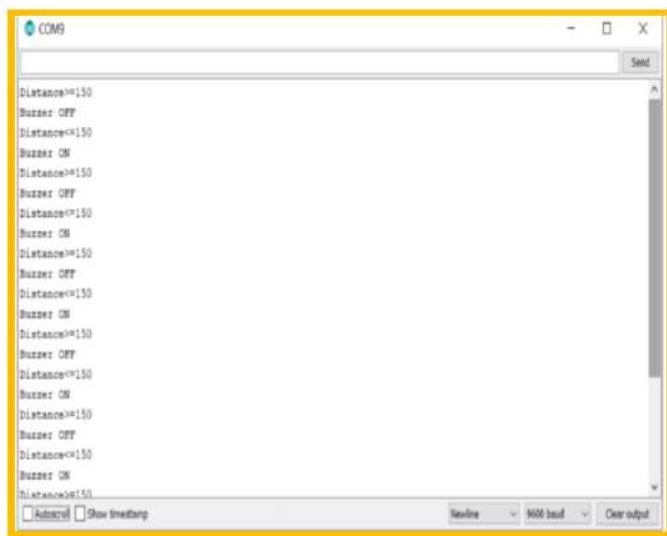

Figure 2: Serial Monitor of Proposed System

RESULTS

If the person wearing COAL is 200 cm away from the other person it would not generate any alert but as soon as it violates this thing buzzer or the LED will start alerting him/her until the distance is not 150 cm or more.

Figure 3: Prototype of Proposed System

LITERARTURE REVIEW

Everywhere on this planet different organizations are using multiple measures to stop the spread of Coronavirus. COVID has resulted in a new way of life and reality where social distancing and wearing of masks have become a necessity for survival as this might not stop COVID but will help in preventing it. (Philippines COVID-19 Control,2020) claimed that people should wear masks and maintain a social distance of one meter between individuals as it could spread through saliva and human contact. The significance of social distancing is it prevents the spread of any contagious disease, it resulted in online schools and colleges which results in less stress and better blood sugar, and last but not least it is extremely important for people who are at higher risk with any severe illness as they don't want to go to overcrowded places it helped them to maintain the distance in the public places. While vaccines are available in the market, social distancing is the only viable strategy for combating this pandemic.

Maintaining the appropriate gap for social distancing is not always feasible. Whenever we are out, we mostly forget to maintain the distance as soon as we get involved in our daily work. Many projects are out in the market that are using Machine Learning concepts, some are using Artificial Concepts, some are using Image Processing Techniques as all of them lacked in usage as one needs to be an expert in these skills to use these systems. This writing audit looks at how Social Distancing Alert System will be a vital tool that will help us in fighting this battle with it. I have read some of the articles and publications which were released between the year 2009 and 2021. This review paper focuses on the efficiency and usage of technology to stop the global pandemic. This research answers all the doubts related to the impacts of technology on Social Distancing:

1. Is it effective in maintaining social distancing?

2. How does social distancing prevent COVID?

3. Will technology dominate humans as it would be controlling us to maintain social distancing?

CONCLUSION

Every administration is taking different measures to stop the spread of Coronavirus and it should be our moral duty to follow their advice to live and maintain a healthy lifestyle. I feel technology can play a crucial role in maintaining social distancing protocols, which might not stop COVID but will help in preventing COVID. The framework (COAL) depicted in this paper uses the most commonly used components like Arduino, Ultrasonic Sensor, LED's, and a buzzer. It is a small and easy-to-wear device that will help the world at large and will help us in fighting this Coronavirus.

REFERENCES

[1] Abhiruchi Passi and Devdutt, "Manav Rakshak: Device to Help Maintain Social Distancing", vol.9, Issue-4 April 2020.

[2] Narinder Singh Punn, Sanjay Kumar Sonbhadra and Sonali Agarwal, "Monitoring COVID-19 social distancing with person detection and tracking via fine-tuned YOLO v3 and Deepsort techniques", vol.2, Issue-6 May 2020.

[3] Enoch Arulprakash and Martin Aruldoss, "A Study on Fight Against COVID-19 from Latest Technological Intervention", Issue-19 August 2020.

[4] Adina Rahim, Ayesha Maqbool and Tauseef Rana, "Monitoring social distancing under various low light conditions with deep learning and a single motionless time of flight camera", Issue-February 25, 2021.

[5] Mohammad Nasajpour, Seyedamin Pouriyeh, Reza M. Parizi, Mohsen Dorodchi, Maria Valero and Hamid R. Arabnia, "Internet of Things for Current COVID-19 and Future Pandemics: An Exploratory Study", Issue-November 12, 2020.

[6] Musa Ndiaye, Stephen S. Oyewobi, Adnan M. Abu-Mahfouz, Gerhard P. Hancke, Anish M. Kurien and Karim Djouani, "IoT in the Wake of COVID-19: A Survey on Contributions, Challenges and Evolution", Issue-October 22, 2020.

[7] https://www.arduino.cc

[8] https://components101.com