



WEARABLE SOCIAL DISTANCING DETECTION SYSTEM: A Review

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Abstract: The COVID-19 pandemic has spread throughout the world and changed all facets of our everyday lives dramatically. The conventional method of keeping people at a safe distance in the Covid-19 Standard Operating System could not ensure everyone obeys the rule. An automatic social distancing system needs to be created to assist and train individuals to stay at a safe distance of at least 1 m. This paper proposes a wearable social distancing detector that uses a microcontroller with an ultrasonic sensor to detect the distance between two persons and provides a warning if the person fails to obey the rule. The system could perform social distancing detection accurately and can assist in the Arduino UNO.

Index Term - Covid-19 , Ultrasonic Sensor ,Arduino UNO

I. INTRODUCTION

Social distancing is purposely maintaining the physical space between individuals to prevent spread of illness. Keeping a distance of at least one metre from other people lessens the chances of getting infected with COVID-19.

wearable device capable of sensing the distance between two individuals and triggering an alarm in the event of proximity between the individuals. The occurrence of Covid-19 has led to the exploration of various techniques to reduce the spread of the disease. These include the detection of the region at risk, tracking the location of workers, tracing contacts, identification of spreaders, tracking Covid-19 symptoms and others . The existence of a device that can automatically detect the distancing of one to another to remind surrounding people to obey the rule will complement the current SOP very well, to an even better extent.

II. RESEARCH PROBLEM

Covid-19 has been a major health risk to many people with different measures being introduced by various health experts on how to avoid contracting the disease. Wearable device that I will create will be meant to address the issue of social distancing which can be a major challenge for many people. Some of the research questions that will guide my research include: How does the smart device help in minimizing the spread of the Covid-19 pandemic? What are the main components of the device? How will the device work in making sure that people maintain social distance?

III. RESEARCH METHODOLOGY

The development of the system was carried out in three main phases which are hardware development, software development and testing. In the hardware development phase, the circuit was first designed and simulated. Once it was confirmed that it produced the required output correctly, the circuit was constructed. The software development phase was performed simultaneously with the hardware development phase and modular approach was implemented where the program was divided into several modules and each module was tested separately before they were combined to form a working program.

IV. PREPROCESSING OF THE DEVICE

A. Hardware Development

The system consists of an ultrasonic sensor, a microcontroller, a buzzer. In this work, the HC-SR04 ultrasonic sensor was used to detect the distance of any obstacle behind the person wearing the device. The function of the microcontroller is to read the value from the sensor.



Fig. 1. Block diagram of the system

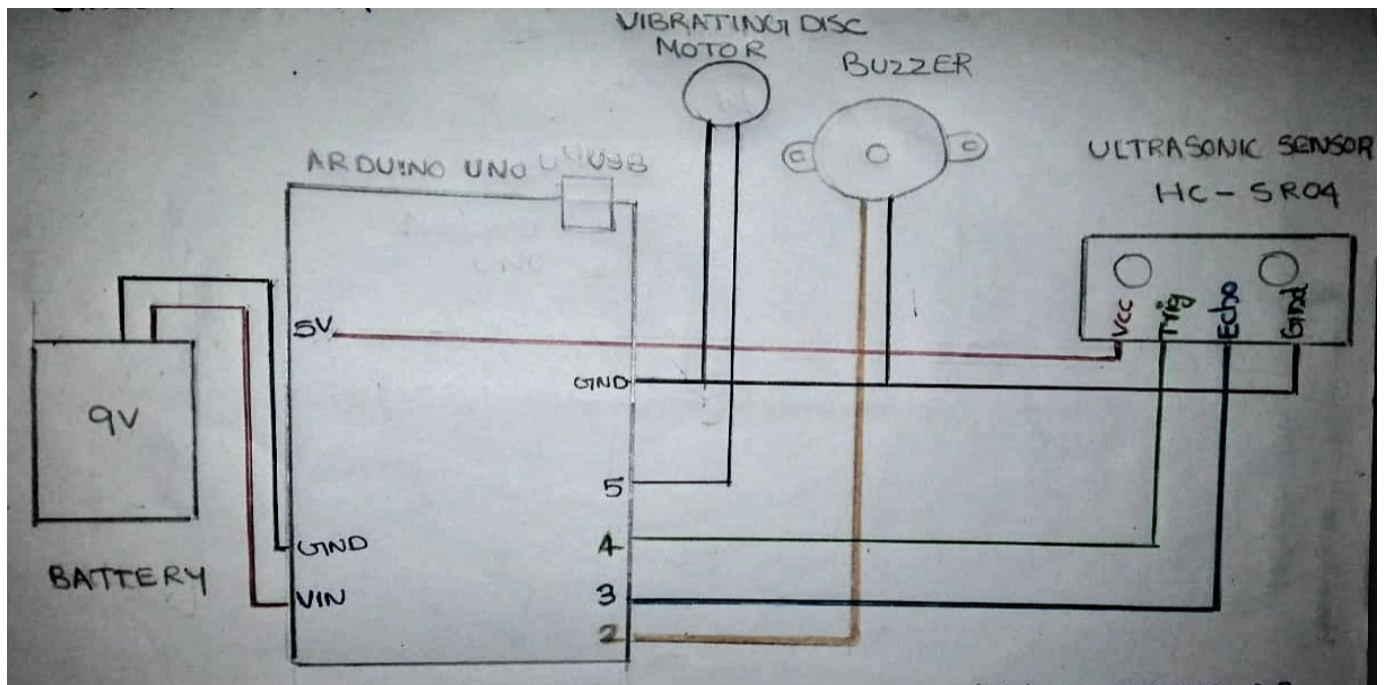


Fig.2.Circuit diagram of the system

B. Process of Detecting Social Distancing

The program/ code is already uploaded in the microcontroller. The condition implemented in the code is that when the distance is greater than 1 meter the condition goes true and the buzzer starts ON. If the distance is less than 1meter the other condition goes true and buzzer will not ON this time.

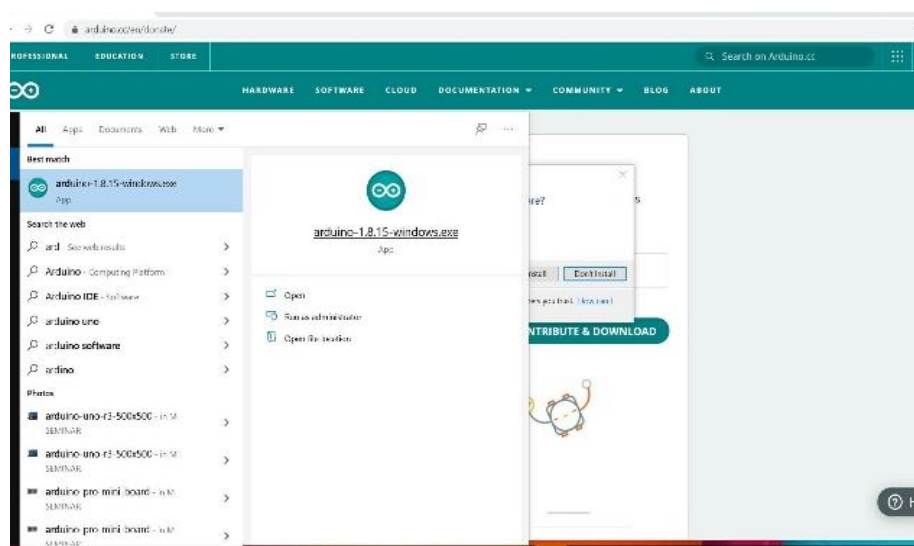


Fig .3. Installing Arduino IDE Software

V. CONCLUSION

The development of the wearable social distancing detection system has been described in this paper. The system employed an Arduino UNO and an ultrasonic sensor to detect and measure the distance between a subject and a person near by. a buzzer to notify that the physical distancing of 1-metre is not followed. The system has been tested successfully and it could perform the social distancing detection accurately. This system can be improved to be more interactive to the user such as by sending a notification through a smartwatch to remind them of their distance or including a vibrating disc to increase the awareness to the user. Thermal or infrared sensor also can be included to detect a human's body temperature to produce more accurate results of detecting another human near the user. These measures secure physical distance between people (of at least one metre), and reduce contact with contaminated surfaces, while encouraging and sustaining virtual social connection within families and communities.

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REFERENCES

- [1] A. R. Alsaedy, K. P. Chong, "Detecting Regions At Risk for Spreading COVID-19 Using Existing Cellular Wireless Network Functionalities", IEEE Open Journal of Engineering in Medicine & Biology, 2020
- [2] E. Waltz, "Back to Work: Wearables Track Social Distancing and Sick Employees in the Workplace as companies re-open, employees may don wearable tech to prevent the spread of COVID-19", IEEE Spectrum, May 2020.
- [3] H. A. Abdulqader, M. G. Vargese, N. A. Nabhani, "Dynamic Short Distance Estimation Using ultrasonics", IEEE Business, Engineering & Industrial Applications Colloquium, 2012.
- [4] R. Stojanović, A. Škraba, B. Lutovac, "A Headset Like Wearable Device to Track COVID-19 Symptoms", 9th Mediterranean Conference on Embedded Computing, 2020, pp 1-4.
- [5] E. S. M. Chin, "Dr Noor Hisham: Children Still Categorised High-Risk for Covid-19 Though No Child Mortality Cases Locally", Malay Mail, 9 Jun 2020.
- [6] L. Zhendgong, H. Shuai, L. Zhaoyang, L. W eifeng, H. Daxi, "The ultrasonic distance alarm system based on MSP430F449", Measuring Technology and Mechatronics Automation, 2013, pp1249-1251.
- [7] www.learningaboutelectronics.com
- [8] <https://components101.com>
- [9] Arduino website <http://www.arduino.cc/>
- [10] Rahul Reddy Nadikattu, Sikender Mohsienuddin Mohammad, Dr. Pawan Whig, "Novel Economic Social Distancing for COVID19", Scopos Paper, June 2020
- [11] Blaine Reeder and Alexandra David, "Health at hand: A systematic review of Smart Watch uses for health and wellness", Journal of Biomedical informatics, 2016.