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Social Distancing Kit

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Abstract – *Internet Of things in the 21st generations can fight against COVID-19. COVID-19 is a global pandemic which has brough general changes to human life. COVID-19 has changed the IoT framework and management to a larger extent. COVID-19 virus can be reduced with the help of social distancing and sanitizing. Social distancing can reduce the risk of COVID. To main physical distancing between people, we have made a project which will help people to maintain a 2 meter of distancing between them using different IoT sensors and Arduino micro-controller board. Physical distancing will be pat of our life till COVID is under control, and this project will help to maintain a secure distance from others*

Key Words: COVID, Arduino, Social Distancing, IoT, sensors.

1. INTRODUCTION

The global pandemic corona virus (COVID-19) outbreak emerged first time in 2019 in Wuhan, China. Since from December 2019, the virus went on spreading to 213 countries and territories. Corona Virus disease is a contagious disease with incubation of one to fourteen days of incubation period. It is a time where patient is not having any symptoms of COVID virus, technically called as SARS-COV-2.

When an outbreak initial breaks get into cities, early detection, uninflected the infected person and tracing potential contacts are measured are much essential. IoT protocols, notably Bluetooth Low Energy (BLE) still as NFC, RFID, GPS, and {WIFI | wireless local square measure network |WLAN| wireless fidelity | WIFI| local area network |LAN} are receiving abundant attention for providing solutions to those challenges. for instance, these technologies are utilized in wearables and disposable check cartridges for moveable identification. Here we tend to are facing the challenges with this digitalization together with machine time, data rate, coverage, energy consumption, price and utility.

The motivation for doing this project was primarily an interest in undertaking a challenging project in a stimulating area of research. IOT is vastly developing field in autonomous technology. Making use of network technologies and providing the features of these technologies to prevent COVID-19 epidemic by practicing social distancing with the assistance of minimal technology enhancements is what led us to the choice of this project

The key method to reduce the risk of corona virus is to implement social distancing between 2 or more persons. Social distancing is the rule which has been regarded by authorities from all over the world and is a key method to manage COVID-19 virus. Many digital technologies such as IoT, Artificial Intelligence, and many more are helping us to prevent corona virus.

Our project mainly consists :

1. Social Distancing Module
2. Avoid Face touching module

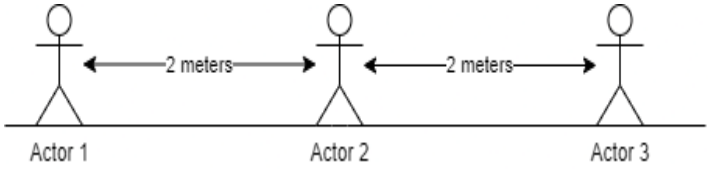

Fig -1: Social distancing

Fig -2: Avoid face touching

We hope to build a social distancing kit which will be able to adapt to its surroundings and comprehend the necessary alerts which are given to user to provide an efficient and automated process. The conditions may contain various type of data such as the current time, location of the distance between 2 persons in centimetres the algorithm will provide the necessary actions which are to be brought into action by the project by calculating the distance between person and store it in some database. Thus, achieving a complete control over the project will prevent the possibility of any further increase covid cases from

occurring. It will increase the precaution of the on boards as well as the surroundings. The level of precaution and safety can be increased by a number of times as compared to the current scenario.

This project aims to solve the problem that occurs by not maintaining social distancing during COVID pandemic. Our project is capable of automatically analysing the distance between 2 people suggested by governments. It's capable of automatically analysing the governmental norms set for social distancing and based on the set criteria it will define the decision best suited in that particular situation and will act upon it. Social distancing Kit will be easy to use and wear with an alarming facility to user

The project is built using Arduino as a processing and controlling unit of the system, the social distancing kit will be accessing the geometric assets such as the distance between the persons which are horizontally parallel to the object with the help of sensor's data which will be received by the Arduino. The sensors used for this purpose are ultrasonic sensor the Social distancing kit operates on the data received from the sensors and makes it so that it can foresee any potential hindrance in between the people while meeting.

2. LITERATURE SURVEY

In India, as the population is about 136 crores, maintaining social distancing can be challenging task in localities. The scenes from the wines and alcohol shops are the biggest challenge the India is facing. In pre-corona period, it was so common for everyone to stand very close to the people in the queues that their body was touching, or seating of about 10-14 people in one vehicle where only 7 people are allowed. India have always been a huge crowd.[6]

COVID-19 has drawn attention to hygiene rules for people, with a focus of limiting the number of face touches In article of "Preventing Face touches", they have made a wearable device which can detect the face-touch movement. It contains a watch which have proximity sensor in it. It may help to reduce the occurrences of face-touch [1].

In article of "COVID 19 Social Vaccine Toolkit" the specify that Social distancing plays a polar role in preventing the unfold of infective agent diseases sicknesses like COVID-19. By minimizing the shut physical contact among individuals, we will scale back the possibilities of catching the virus and spreading it across the community. This two-part paper aims to supply a comprehensive survey on however rising technologies, e.g., wireless and networking, computing (AI) will alter, encourage, and even enforce social distancing follow. during this half I, we offer a comprehensive background of social distancing as well as basic ideas, measurements, models, and propose varied sensible social distancing eventualities. we have a tendency to then discuss sanctioning wireless technologies that square measure particularly effective and might be wide adopted in follow to stay distance, encourage, and enforce social distancing generally. These technologies open several new solutions and directions to alter issues in social distancing, e.g., symptom prediction, detection and observance isolated individuals, and speak to tracing [2].

3. SYSTEM ARCHITECTURE

Our project is a wearable device which consist of 2 sensors. One sensor is Face sensor which will help user to stop touching its face. And second sensor will be social distancing sensor which will help user to keep a safe distance with other people. If any of the rule is unfollowed alarm will go on until rules are followed of social distancing. This will help the user to stay alerted and prevent the risk of COVID-19.

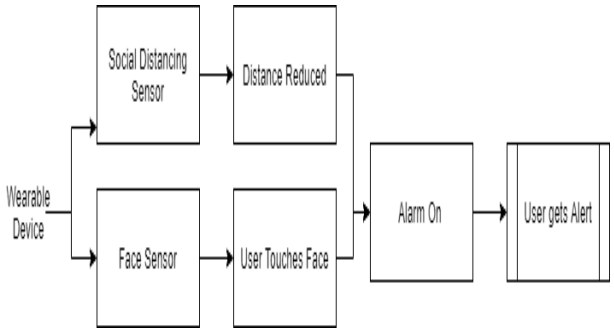

Fig -2: System Architecture of Social Distancing Kit

The project consists of cap which user can wear on head. On front side of cap, an ultrasonic sensor is mounted facing downward which keeps track of hand or any other thing which touches the face. When hand or any other object comes near the face user gets alerted by LED placed Infront of his eye and a buzzer sound, it will help user to remove the object/hand in front of his face immediately. Arduino board is placed on cap. The second sensor which is social distancing sensor is connected with Arduino through wires. Ultrasonic sensor is mounted on a clip. The clip can be attached to the shirt/T-shirt of person facing towards front. That sensor will give alerts to user if distancing limit decreases.

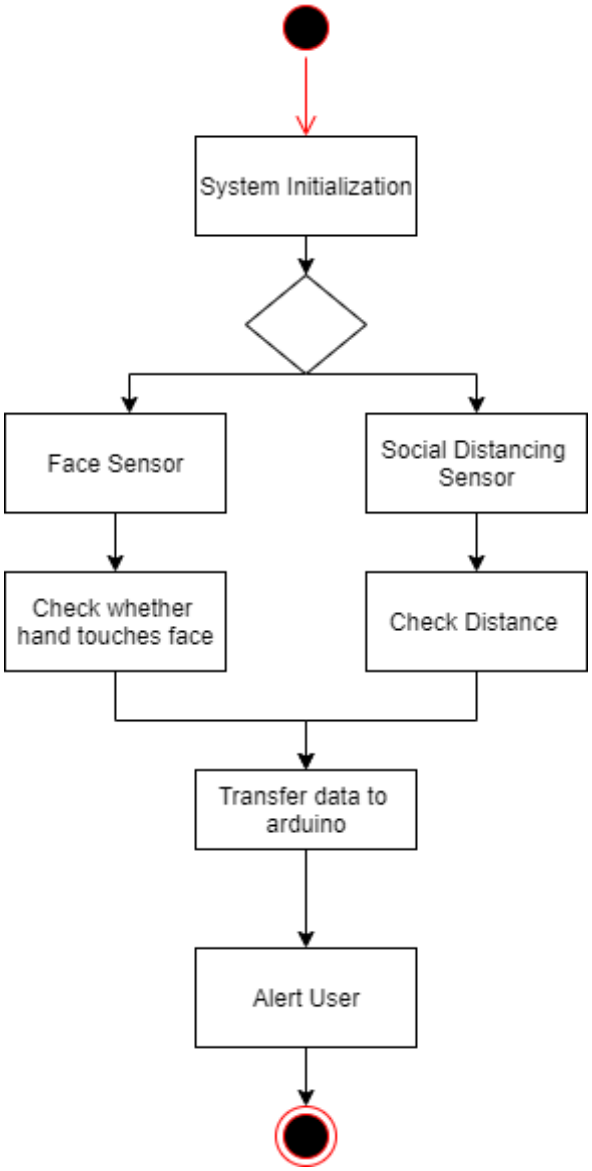

Fig -3 : Activity Diagram for social distancing kit

Modules of social distancing kit are:

1. **Ultrasonic social distance measuring module:** This module is mounted on the shirt using a clip. This module captures the distance f the user and the man standing in front of him. The distance limit is set to 200 cms which is about 2 meters which is given by government to follow social distancing.
2. **LED module**: The LED is placed on the top of the cap, Infront of user. So whenever social distancing is not practiced, it glows dark so user gets alert.
3. **Buzzer module**: Buzzer module is useful for blind people so that they can avoid person and maintain physical distancing. It is an alert module for both blind and normal person
4. **Ultrasonic No face touching Module**: This module is to prevent the face touches of a person. On an average person touches his face 48 times a day. This module will prevent person to touch his face using an alert.
5. **Social Distancing Kit**: This kit is easy to wear and can be used by anyone. This kit is powered by mobiles. This kit requires a very low charge (about 5V). It requires continuous charging. This kit has 2 ultrasonic sensors which are placed on bod and on cap. They are easy to handle and can be used in day-to-day life. This kit can also be used by a blind man to avoid persons in front of him.

4. FEATURES

1. Automated Alerting System.
2. Person avoiding using IoT devices.
3. No face touching in public places.
4. Reduces Risk of COVID
5. Useful for blind persons also to avoid anything in front of them.
6. Faster Actions due to programmed algorithm
7. Visible and audible alerts.

5. RESULT

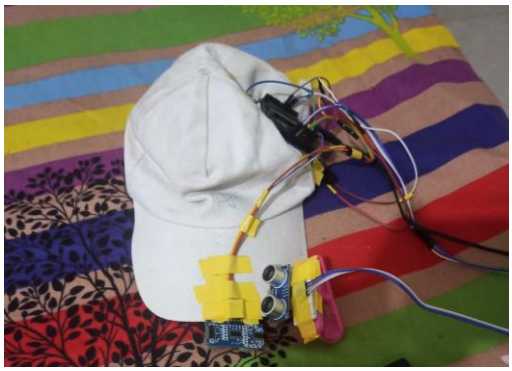

Fig -3: Prototype of Social Distancing Kit

Objectives:

a. The project aims to solve the problem that occurs by the not maintaining social distancing and touching face again and again

b. Alerts to user when social distancing is not maintained.

c. Automatic person detection according to norms set by government and act according to it

d. It's capable of automatically analyzing the distance between user and people standing within 2 meters from him

Fig -5: Social Distancing Kit Output

6. APPLICATIONS

Such type of device can be used by everyone from age 18 and above and those who carry a mobile phone. The weight of device is almost 90 grams which is almost nothing as compared to helmets. It can reduce the risk of COVID and many other diseases by maintain and following social distancing. It can also prevent face touches and reduce risk of any disease which is on our hand and can be transmitted to stomach if touched to face. This device will be most useful to blind persons to avoid persons in front of them such as light-poles, persons, buildings, etc.

7. FUTURE SCOPE

Social distancing kits should have rechargeable batteries and weight should be less so that it can be used by kids and teens below 18. They can also be made water resistant so that in rainy season they can be used. It can be used by blind person to avoid any kind of object in front of him. As project is having audible alert facility, it will help him to avoid and dangerous object while walking.

8. CONCLUSION

A device which is capable of detecting different persons in its environment and can maintain physical distancing between two persons. We have used ultrasonic sensors which have faster actions due to a programmed algorithm in Arduino Uno. Social distancing Kit also helps user to give alert messages when social distancing is not followed. This device can be also used by blind people to avoid persons in front of them. This device is also capable of creating distance by unavoidable beeps from buzzer to user. Device is easy to wear and easy to use. Buzzer beeps when a person is detected by social distancing kit, and the user is alerted at the same time. When user touches his face, then alert goes to user. Touching face can increase the risk of COVID or any other disease. Our kit comprises of a cap which is easy to wear and a clip which is also easy to stick on shirts or dress. Our device needs continuous charging from mobile to work.

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