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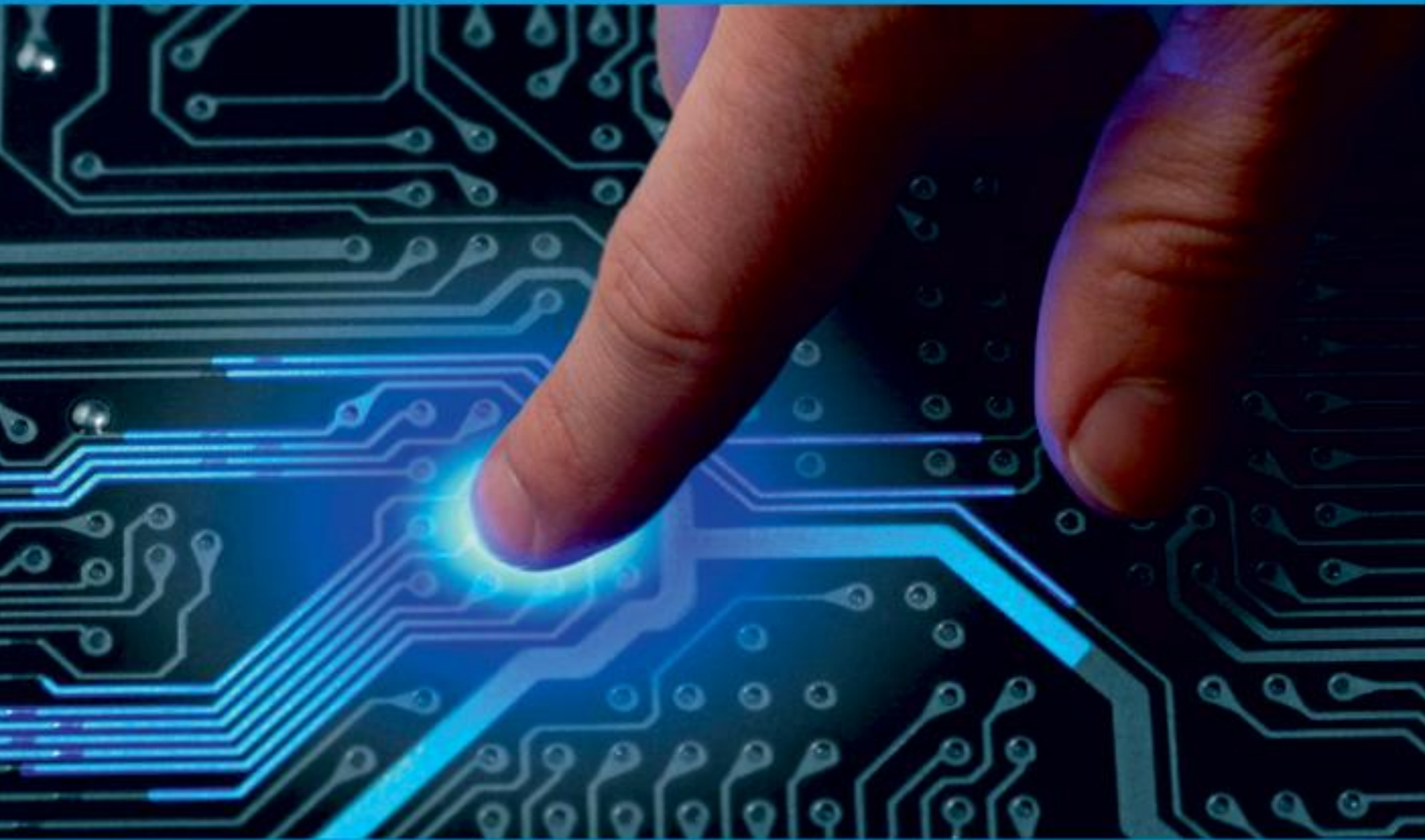

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IOT Based COVID -19 Social Distance Measurement Using Arduino and Ultrasonic Sensor

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ABSTRACT- The COVID-19 pandemic has necessitated the implementation of social distancing measures to curb the spread of the virus. However, it can be challenging to maintain a safe distance from others, especially in public places. This is where an IoT-based social distance measurement system can be useful.In this project, an Arduino-based system using an ultrasonic sensor is used to measure the distance between individuals. The system consists of an ultrasonic sensor connected to an Arduino board, which is programmed to calculate the distance between the sensor and an object. The data is transmitted wirelessly to a central server, where it is analyzed to determine if social distancing guidelines are being adhered to.The system is designed to be easily deployable in various settings, such as shopping malls, airports, and other public places. It provides real-time feedback to individuals to ensure that they maintain a safe distance from each other. The system can also be configured to alert authorities if social distancing guidelines are not being followed.Overall, this IoT-based social distance measurement system has the potential to play a crucial role in controlling the spread of COVID-19 and other contagious diseases.

KEYWORDS: IoT,COVID-19,Social distancing,Arduino,Ultrasonic sensor,Wireless communication,Real-time feedback,Public places,Safety guidelines,Contagious diseases.

I.INTRODUCTION

The COVID-19 pandemic has affected the world in many ways, including changing the way we interact with each other. Social distancing has become a critical strategy in controlling the spread of the virus. However, it can be difficult to maintain a safe distance from others, especially in public places. This is where an IoT-based social distance measurement system can be useful.The system uses an ultrasonic sensor connected to an Arduino board to measure the distance between individuals. The data is transmitted wirelessly to a central server, where it is analyzed to determine if social distancing guidelines are being adhered to. The system provides real-time feedback to individuals, encouraging them to maintain a safe distance from each other.In this project, we will explore the design and implementation of an IoT-based social distance measurement system using Arduino and an ultrasonic sensor. The system has the potential to play a crucial role in controlling the spread of COVID-19 and other contagious diseases, making public places safer for everyone.

II.LITERATURE SURVEY

There are several studies and projects that have explored the use of IoT and sensor technologies in measuring social distancing during the COVID-19 pandemic. One study published in the journal Sensors in 2021 proposed an IoT-based system for monitoring social distancing in public places using Bluetooth Low Energy (BLE) beacons. The system used a mobile application to detect nearby BLE devices and calculate the distance between them to determine if social distancing guidelines were being followed.

Another study published in the International Journal of Advanced Science and Technology in 2020 proposed a social distance monitoring system using a combination of image processing and deep learning. The system used cameras to capture images of individuals and deep learning algorithms to analyze the images and calculate the distance between them.

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Several projects have also been developed using Arduino and ultrasonic sensors to measure social distancing. One such project, developed by a group of researchers at the University of Southern California, used an ultrasonic sensor connected to an Arduino board to measure the distance between individuals and alert them if they were too close.

Overall, these studies and projects demonstrate the potential of IoT and sensor technologies in measuring social distancing during the COVID-19 pandemic. These technologies can provide real-time feedback to individuals and authorities, helping to control the spread of the virus and keep public places safer.

III.PROBLEM STATEMENT

The problem is that maintaining social distancing guidelines in public places can be challenging, and individuals may not be aware of when they are too close to others. This can lead to an increased risk of COVID-19 transmission and other contagious diseases. Additionally, it can be difficult for authorities to monitor and enforce social distancing guidelines in public places.Therefore, there is a need for an IoT-based social distance measurement system that can accurately measure the distance between individuals and provide real-time feedback to encourage adherence to social distancing guidelines. The system should be easy to deploy in various settings, and it should be capable of alerting authorities if social distancing guidelines are not being followed.

IV.PROPOSED METHODOLOGY

Proposed Algorithm
Step 1: Start
Step 2 : Set distance Value for Sensor
Step 3 : calculate distance from sensor
step 4 : if (distance > set Value)
Buzzer On
else
Buzer off
Step 5: Send to blynk cloud
Step 6: End
Here's a breakdown of the algorithm:
Step 1: Start This is the starting point of the algorithm.
Step 2: Set distance Value for Sensor A value is set for the distance sensor to detect a certain distance from an object.
Step 3: calculate distance from sensor The distance is measured from the sensor to an object in front of it.
Step 4: if (distance > set Value) If the distance measured is greater than the set value, the next step is executed.
Buzzer On The buzzer is turned on to indicate that the object is within a safe distance.
else If the distance measured is less than or equal to the set value, the next step is executed.
Buzzer off The buzzer is turned off to indicate that the object is too close.

Step 5: Send to blynk cloud The measured distance and the status of the buzzer are sent to the Blynk cloud, which is an Internet of Things (IoT) platform that can be used to remotely monitor and control devices.

Step 6: End This is the end of the algorithm.

This is a simple example of how to control the built-in LED on the ESP32 using the Arduino IDE. However, it's important to note that the built-in LED pin may vary depending on the specific ESP32 board you are using. In some cases, you may need to refer to the pinout diagram for your board to determine the correct pin to use for the built-in LED. In the setup function, we initialize the serial communication and configure the trigPin as an output and the echoPin as an input.

In the loop function, we first set the trigPin to LOW, then HIGH for 10 microseconds, and then LOW again. This triggers the ultrasonic sensor to send out a sound wave. The pulseIn function then measures the time it takes for the sound wave to bounce back to the sensor and return to the echoPin.

We then calculate the distance based on the speed of sound and the duration of the sound wave. The distance is printed to the serial monitor.

This is a basic example of how to interface an ultrasonic sensor with the ESP32. However, it's important to note that the exact pinout and code may vary depending on the specific ultrasonic sensor and ESP32 board you are using. Additionally, you may need to adjust the code to suit your specific project requirements, such as adding threshold values for distance measurements or integrating the sensor data with other systems or platforms.

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Fig:Testing of Ultrasoni

V.PROJECT PURPOSE

The purpose of this project is to design and implement an IoT-based social distance measurement system using Arduino and an ultrasonic sensor. The system will accurately measure the distance between individuals and provide real-time feedback to encourage adherence to social distancing guidelines.The project aims to develop a system that is easy to deploy in various settings, such as shopping malls, airports, and other public places. The system will be capable of wirelessly transmitting data to a central server for analysis, allowing authorities to monitor compliance with social distancing guidelines.The system's primary purpose is to help control the spread of COVID-19 and other contagious diseases by providing real-time feedback to individuals and alerting authorities if social distancing guidelines are not being followed. Additionally, the system may have applications beyond the current pandemic and can be used to promote safe social distancing practices in the future.The purpose of these projects is to provide personal safety and security solutions for women. These projects aim to leverage technology such as GPS and GSM to develop wearable or portable safety devices that can be activated in case of an emergency or attack. The devices are designed to alert family members and the police, share the location of the victim, and provide a defense mechanism such as an electric shock to ward off the attacker. The goal is to provide a sense of security to women and empower them to take control of their safety in potentially dangerous situations.

VI.FUTURE ENHANCEMENT

There are several potential future enhancements for this IoT-based social distance measurement system. Some possible enhancements are:

1. Integration with facial recognition technology: The system can be integrated with facial recognition technology to identify individuals who are not wearing masks or are not complying with other safety guidelines.
2. Integration with AI/ML algorithms: The system can be enhanced with AI/ML algorithms to improve the accuracy of distance measurements and reduce false positives/negatives.
3. Integration with thermal imaging sensors: The system can be enhanced with thermal imaging sensors to detect individuals with fever, a common symptom of COVID-19.
4. Integration with other IoT devices: The system can be integrated with other IoT devices, such as smart lights or alarms, to provide additional feedback to individuals who are not complying with social distancing guidelines.
5. Mobile application: The system can be enhanced with a mobile application that allows individuals to view their social distancing compliance score, receive alerts, and view the status of their surroundings.
6. Overall, these enhancements can improve the accuracy, efficiency, and effectiveness of the IoT-based social distance measurement system, making public places safer for everyone.

VII.CONCLUSION

In conclusion, the COVID-19 pandemic has highlighted the importance of social distancing in controlling the spread of contagious diseases. However, it can be challenging to maintain social distancing guidelines in public places, and individuals may not be aware when they are too close to others. An IoT-based social distance measurement system can help address this problem.This project aimed to design and implement an IoT-based social distance measurement

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system using Arduino and an ultrasonic sensor. The system accurately measures the distance between individuals and provides real-time feedback to encourage adherence to social distancing guidelines. The system is easy to deploy in various settings, and it wirelessly transmits data to a central server for analysis, allowing authorities to monitor compliance with social distancing guidelines.Future enhancements to the system, such as integration with facial recognition technology, AI/ML algorithms, thermal imaging sensors, other IoT devices, and a mobile application, can further improve the accuracy, efficiency, and effectiveness of the system. Overall, an IoT-based social distance measurement system has the potential to play a crucial role in controlling the spread of COVID-19 and other contagious diseases, making public places safer for everyone

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