Social distance monitoring robot in queue based on IOT

[1]Kondreddy sivakumar,[2] Saurabh kumar singh,[3] E chandu, [4]Shaik bajan basha,[5] Sachin kumar, [6]M K Shukla

1,2,3,4,5 UG Scholar, Department of Electronic and Communication Engineering, Lovely professional University, Punjab, India-144411.
6Assistant professor in Department of Electronic and Communication Engineering, Lovely professional University, Punjab, India-144411.

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Abstract: We all know that covid-19 situations effects our lives a lot in recent days. During those current situation, social distancing plays crucial role because it helps limit the increment of Covid cases due to the perceived distance between people who spread the disease. At present, there is no way to place one person in each row in a queue or any place to monitor social distancing violations. Public places like shopping centres, cinema theatres, Parks and schools, government offices and tourist places etc. Many peoples in queues for several hours a day. To monitor the social distance in various public places in queue, we want to develop a social distance monitoring robot based on IOT. The moving robot capture the visuals of people (which was controlled by a person) as they are in certain distance or not, calculated with the help of various sensors and gives the analysis to the controlled persons.

1.Introduction

The COVID19 effect has started worldwide and turns into a big health issue and started destroying not only economical systems but also free life of people all over the world their health and wealth. In that situation many countries started avoiding physical contact with people and started using machines and robots to control these hazard. Many governments and countries got alerted on this situation to take social distancing on to the people in rushed areas as well as in many crucial administrative places. This will monitor the norms and actions of people, that they were following the rules or not and taking necessary norms on people to follow the rules for prevent this situation.

We have to take our step forward from our side to maintain such rules for reduces the covid. So, we are also going to make the mechanically controllable device that will monitor the actions and precautions taken by the people in public places and also giving the report and index of the report as feedback to us. In deeply it observes the distance between the people in a queue as they are strictly following the social distancing and have they properly masked or not which was analysed by the devices connected to the moving robot, which are fixed to the four wheel moving robot which were attached on to that robot as on IOT system. This IOT system helps to send the valuable data to us as it measures the distance of people and send it through WiFi system fixed on the robot. And through that data we will take necessary action and controllable measures.

2.Required Hardware components

Ultrasonic sensor: It is a measuring device that gives the value of distance between two people by emitting the ultrasonic waves and changing them into electrical signals for the sake of easy calculation to system. Ultrasonic waves are reflect back whenever the waves hit an object by the use of transmission and receiving ends in it. the distance on the receiving end by decoding the sonic signals to electric signals.

DC Motor: Electrical energy to mechanical energy conversion is the motor definition. Especially the DC motor has input source is DC current that will helps in drive the conversion of energy by using electric DC current.

It helps to the moment of the robot by the principle given above the definition.

Buzzer: This is the component that makes a sound when a electric signal is passed to it as a input signal to make that sound. This component role in this project to give a alert signal to the surroundings.

IC: It is the component that has many passive components integrated on a single silicon chip that has inbuilt resistor, capacitor etc.. which is well knowned component in many electronic circuits and systems.

Transistors: Voltage or current flow regulation is called transistor. It also acts as switch in circuits for certain input parameters or source
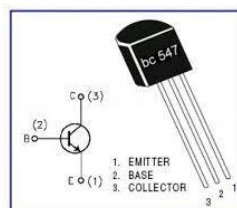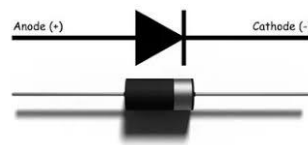

Resistors: Opposing of electrons is the definition of ressistor . It connects in circuit like to the anode of led for resisting the enough supply to led.


Capacitor: it is the component for the efficient of time producing the potential difference that it stores the electric charge in it.

*Diode : A*llowing the flow of current in single direction through it.

LED: light emitting diode that emits the light whenever the energy of electric charge flows through it. In many circuits it acts as output to identify the outcome of output.
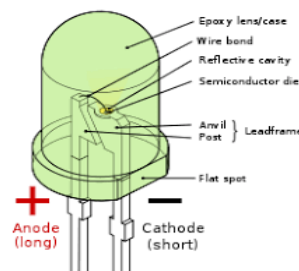
PCB: In any circuit designing Printed circuit board is the main or important component. We connect any many electronic components on it and we connect on the printed schematic lines which make electrically connected.

Wires and connectors: In any electric or electronic circuits wires plays a key role in making connections also as bypassing the components supply.

3. SOFTWARE SPECIFICATIONS

Raspberry pi: It is a computer replaced on a board that also can be connected with mouse and keyboard . we can communicate it with linux to make various designing and projects.

We can use the linux to program to communicate and to work with our iot projects.

It has OS, Ram, CPU, and also capable of GPIO that we can connect various electronic components that to control via those to make in use various internet of things designs and projects.
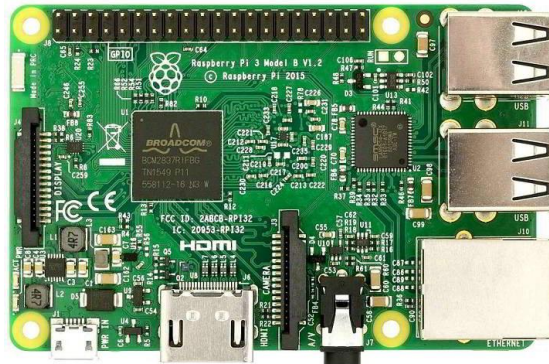
Here we are connecting various electronic devices to this like, camera, wifi module that will sense various visuals, and send the analysed and recorded videos to the destination through the internet connected to the board.

4. ROBOT CONCEPT

It is a moving car type robot in which it has various electronic components and devices like , power source, camera, ultrasonic sensor, wheels and motors as well as wifi model together form the robot which we had used for this project.

4.1 INFO ABOUT THE MOVING ROBOT CONCEPT:

It's a total different concept which we heard about a robot, that here the robot is works on the concept of following a line which was sensitizing by the IR leds that follows the input of black and white lines.

Here the IR sensor controls the moment of the motor left and right as well as front and back.
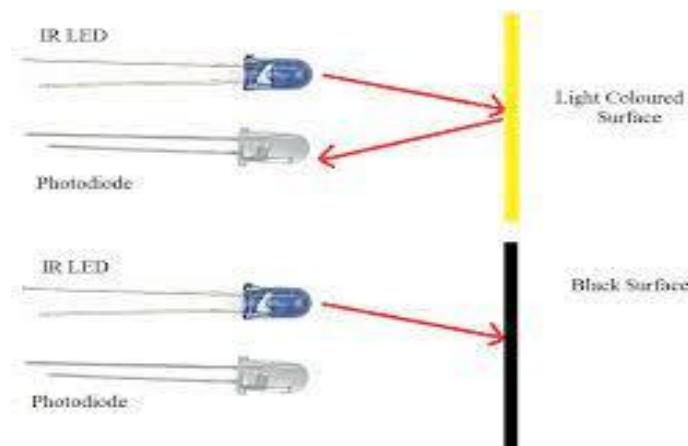
The sensors makes the robot move as, the black and white lines which were the references of the IR sensor that makes the robot moves left if the black line sensed by right sensor else right if the black line sensed on right.
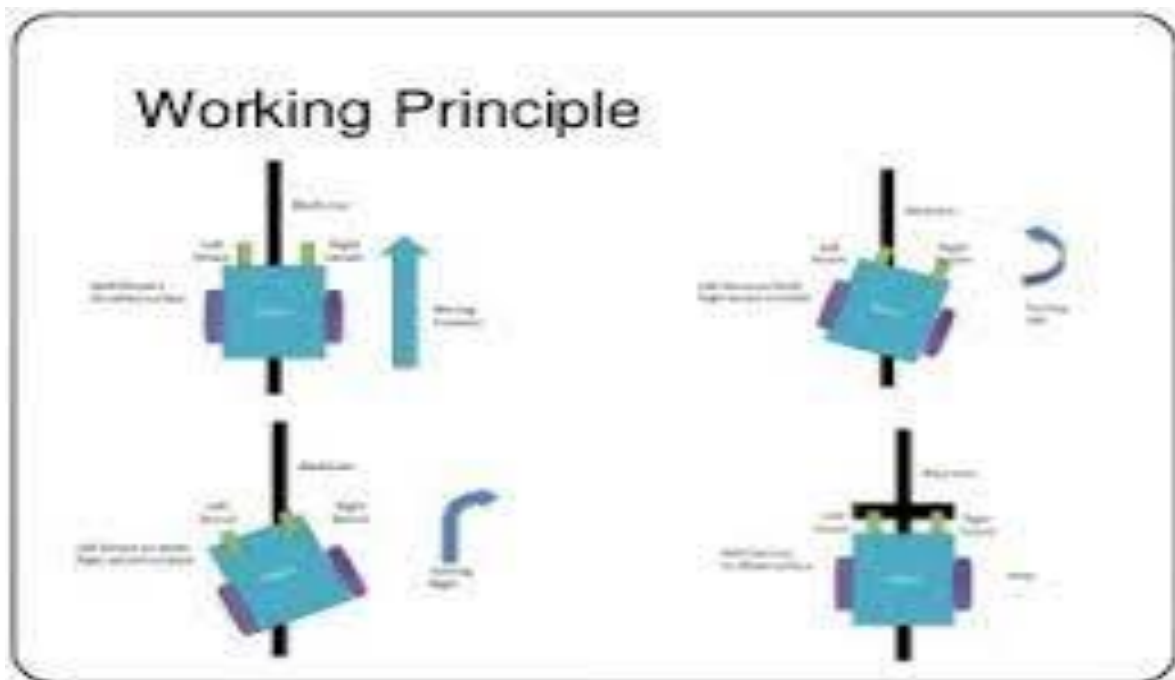
As per the diagram shown above IR sensor transmission and receiving the sensed black and white lines will judge the moment of robot. This makes the robot moment to record the surrounding visuals.

4.2 WORKING OF THE PROJECT:

As we mentioned the components used for thus project, we have the moving robot that moves towards the queue for taking the social distancing visual by using camera fixed on the robot.

Measure the obstacle distance by signal that got by sonic sensor .

This sensor has transmitter that send the signals towards the free space, whenever the transmitted signals hits object then the signal got recived by receiver and then it will calculated it as shown in below.
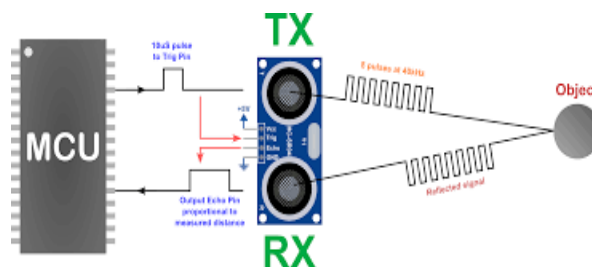
4.3 ARCHITECTURE:

This architecture gives the information about our project that it has two units as:

Two blocks under social distancing monitoring units as shown in the diagram blocks. Those are Rfid, application, sensors, camera, robot system.
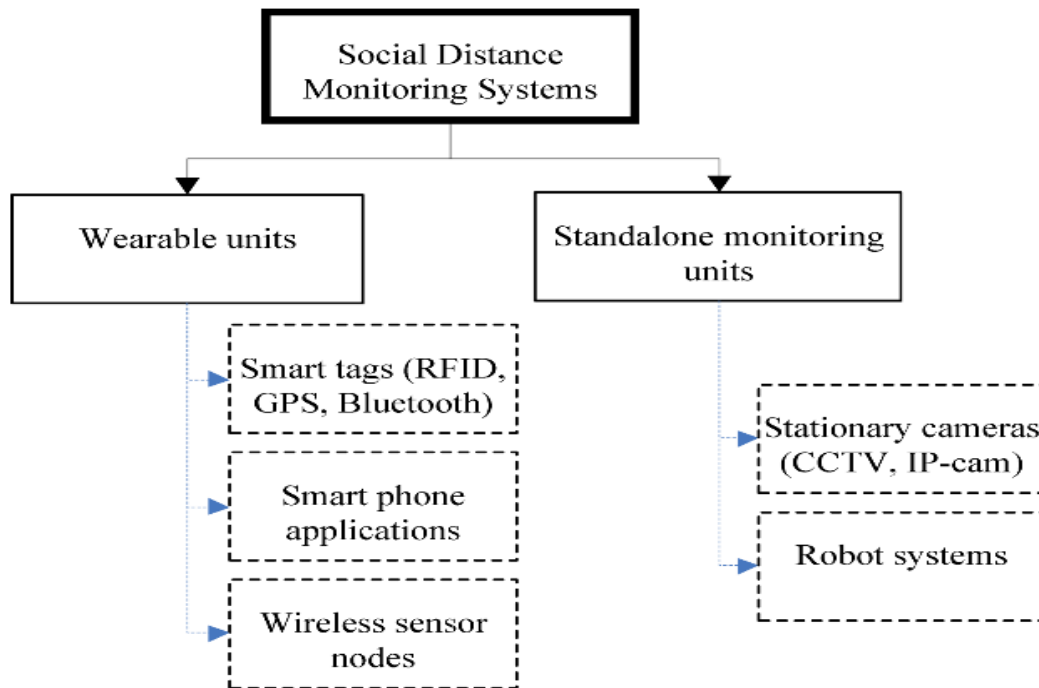
Advantages

1. Accurate automation system
2. Very less errors
3. Wireless communication helps easy tracking
4. Raspberry pi gives less complexity design
5. More reliable in working
6. Easy replacement of in case of damaged components
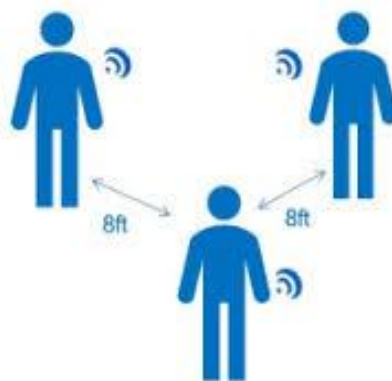
Disadvantages

1. Continuation internet connection required
2. Charged battery required for full time working

CONCLUSION:

Prevention is better than cure, so we have to fought against such a dangerous virus in future, so this device can control and give the preventive steps and cautions to follow the rules to fought against the covid virus on the implementation of social distancing in queue not only in public places but also in various places

So we have to use present day technology like robots, for getting better results in this situation

So our project will definitely helps to maintain such preventive steps and take forward the discipline in crowd as well as people where the social distancing is more efficiently required.

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4. Raspberry pi and IOT appliactions in social distance monitoring is from frontiers in communication networks .

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