

PIR BASED AUTOMATIC FEVER TESTING

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Abstract - Nowadays every country is fighting with COVID-19, giving their best to save living beings. Our doctors, Police and health care workers are exposed to people who are infected by COVID-19. They have to check people whether they are having fever or not so that at least on initial basis they can decide whether COVID-19 test is required or not. Because of this close contact with the patients a health worker is getting infected. This could lead to increase in spread of COVID-19 and even health worker would start avoiding going to work because of such instances. To avoid close contact with patients we have proposed an idea, so that we can save health workers from getting infected.

Key Words: COVID-19, Automatic Fever Testing

1. INTRODUCTION

The main goal behind proposing this is we are using infrared portable thermometer which is required to hold and health worker has to carry it with them which we can see in Fig-1 this could lead to increase in infection. Though there is distance maintained but in some cases it will not be a good practice because we do not know who has COVID-19 so we should avoid even such contacts. Even infected patients are required to monitor every day, there health worker has to go and monitor temperature, any contact there will lead to spread in virus. To avoid this direct contact we are proposing system where health worker do not need to come in contact with patients. In which health worker will be behind the panel and he can see patient through the fiber glass. Once the patient will come in front of the PIR sensor the circuit will get completed and infrared thermometer will be ON, therefore when temperature will be recorded and patient will move away from sensor the infrared thermometer will get OFF. This is how we can avoid contact with patients so that we can save health workers and even carry the required checking of patients. This will build confidence in health worker which quite important in this period. This surely will be an asset for us. Even after this pandemic we cannot assure that something like this will not

Occur in the future, because people will gather again in malls, cinema theatre and there are lot of places where such gatherings can happen so we can use this in malls,

cinema theatre and even in any place where gatherings can happen.



Fig-1: Checking with infrared thermometer

2. SYSTEM OVERVIEW

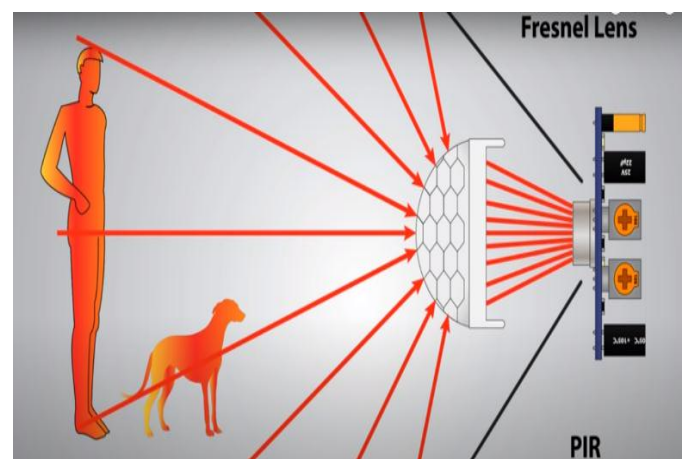


Fig-2: PIR sensor

This system will consist of pyroelectric sensor, in fig-2 HC-SR501 PIR sensor is there, which is having Fresnel lens in front of it to this focuses the infrared signal on pyroelectric sensor. Infrared radiations by the body is sensed by the PIR and thus is circuit is completed to switch on infrared thermometer. This module is connected with arduino board fig-3. This has two potentiometer one is used to adjust the sensitivity and other one is used for adjusting the delay time. Arduino can be also set to two different trigger modes one is repeatable trigger and other is non repeatable mode. Here we will use repeatable trigger which will keep output high all the time until the object is in the sensors range.

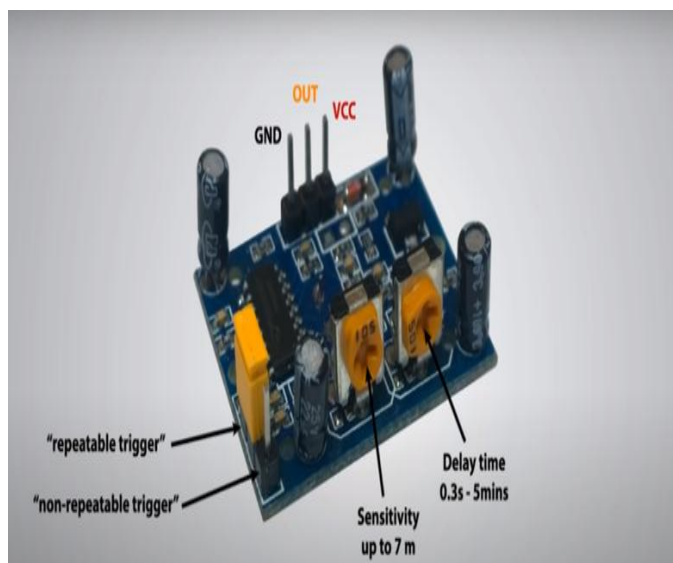


Fig-3: Arduino

This arduino and PIR sensor will be connected in circuit as shown in fig-4. Once the radiation is detected by PIR sensor the infrared thermometer will be turned ON, as we have connected to repeatable trigger the output will remain on higher side until the radiations will be there in PIR sensors range. As the thermometer is ON it will detect the temperature of the body in front of it and this is how we can safely deal with patients using this. Even we can count the number of people in a day who had fever and also the intensity of the temperature people had this all we can consider as the future scope of it.

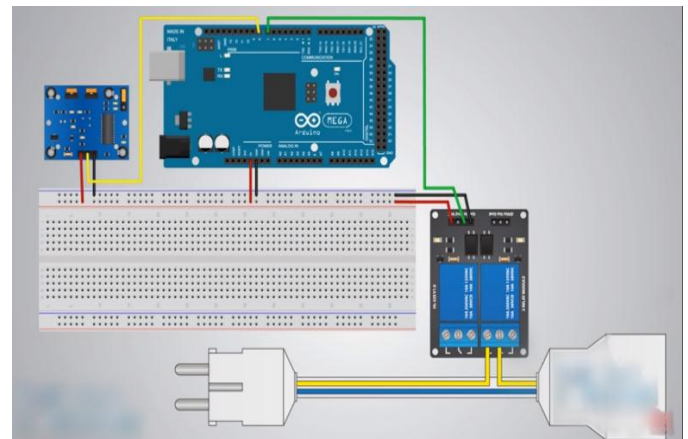


Fig-4: Circuit schematic

But for this we have to code arduino so that it will function as designed. In fig-5 there is arduino code for this system. In this circuit schematic we have given PIR sensor pin as input and relay pin as output, using digital read function we will read output of the sensor, if its high or object is detected it will activate the relay. For activating relay module we will send logic LOW as the relay input pin works inversely. Relay is actually a switch which is electrically operated by an electromagnet and electromagnet is activated with a low voltage for ex. 5V from microcontroller it is used to make or break contact to high voltage circuit here we are using 2 relay module and our device would be infrared thermometer. In this way it will be connected to infrared thermometer.

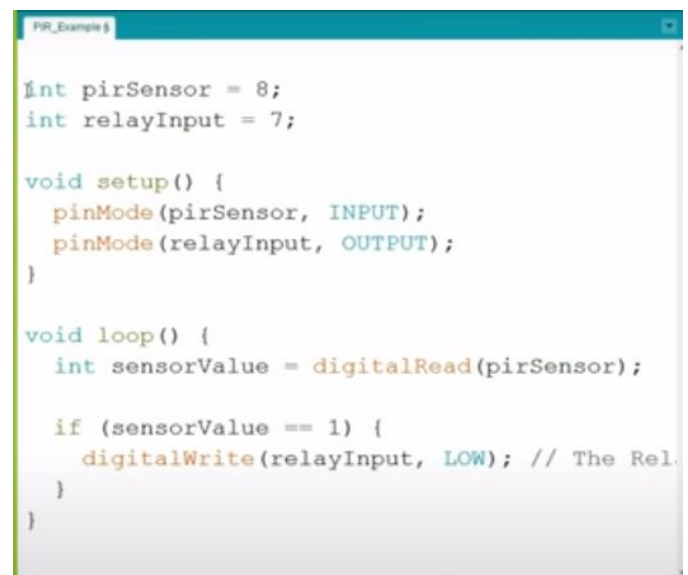


Fig-5: Arduino code

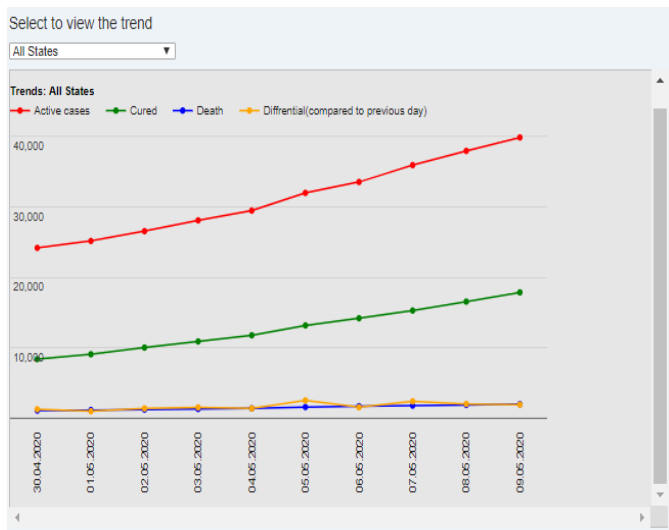


Fig-6: India COVID-19 cases

In fig-6 we can see the number of cases climbing up in India day by day in this number, there are at least 96 doctors and 156 nurses have tested positive till April 22. As most of these infections were transmitted by patients in a hospital environment, at least 826 medical workers who came in contact with the infected personnel had to be quarantined and at least 20 hospitals had to be fully or partially closed. Being more specific Maharashtra accounted for close to 42% of infected doctors, 70.5% of infected nurses and 84% of infected medical workers and does not include administrative staff. Maharashtra have accounted for close to 83% of all doctors quarantined, followed by 11% in Delhi and 6% in Karnataka.

This sensor can be fixed on a wall and then also we can check body temperature so that to avoid any contact with health worker. Even we can code it to store the name of persons and there body temperature to make the process better. There could be one problem if it is fixed on wall that is not every one will have same height, so to compensate that we can provide a staircase there to match height requirement of infrared thermometer.

3. CONCLUSION

The idea describes the way we can help our health workers and even how we can automate the process of checking temperature of patients on self-serve basis so this will also reduce the manpower engaged in checking temperature of patients. Even in future we can use this for malls, cinema theatre and anywhere, where major gathering happens to reduce the risk of spread of any infection.

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