

Contactless Smart Thermometer

Samarth Basu¹, Sudeep Gour², Biswajeet Sahoo³, Dr. Pooja Kulkarni⁴,

¹Samarth Basu, Dept. of Electronics Communication Engineering, Pune

²Sudeep Gour, Dept. of Electronics Communication Engineering, Pune

³Biswajeet Sahoo, Dept. of Electronics Communication Engineering, Pune

⁴Professor, Dept. of ECE, MIT School of Engineering, Pune, Maharashtra, India

Abstract - The need and demand for contactless thermometers rise with respect to time. In today's pandemic situation, checking a person's body temperature is the first thing to do. A person who is infected with COVID-19 will show the first symptom as high body temperature. Thus, we have made a smart thermometer which will be completely contactless with respect to the social distancing. The RFID scanner, MLX90614, Ultrasonic sensor are all interfaced with NodeMCU. The main part of this project is MLX90614 IR thermometer. The idea of the project is that a person will have a unique RFID tag, the RFID scanner will scan the tag and then the thermometer will scan the person's temperature. That temperature will be recorded on a webpage, which will later be stored in cloud.

Key Words: IR, Thermometer, MLX90614, NodeMCU, Webpage, Cloud

1. INTRODUCTION

The measurement of body temperature in day-to-day life is the basic way to determine whether a person is unwell or not. The traditional thermometers like the mercury thermometer, even though it is cheap, the process of taking the human body temperature takes around 5-10 minutes. An IR based thermometer overcomes the problems of traditional thermometer. Since the outbreak of Covid-19, IR thermometers are being used as a screening tool to scan the people at Airports, Railway Stations, and other crowded establishments. The scans are being used to identify potential patients of Covid-19. In this paper, we will be designing and implementing a RFID based Contactless Smart thermometer. This is easy, safe and the measurements are also very accurate. There is storage of data and easily accessible through cloud. We describe the principle of making this type of contactless thermometer monitoring system in this paper.

2. LITERATURE SURVEY

"The RFID Technology and Its Applications": A Review Davinder Parkash, Twinkle Kundu & Preet Kaur gives review of the RFID technology and its applications. This paper gives a brief introduction to principles of RFID, classification of RFID tags and reader, frequencies used, current application, as well

as advantages and limitations. This helps us to decide which RFID Sensor should be used.

"Design and Implementation of Thermal Body System Employing Thermal Sensor MLX 90614 for Covid-19 Symptoms Early Detector" Puput W. Rusimamto¹, Rina Harimurti, Endryansyah, Yeni Anistyasari, Lilik Anifah gives us the basic idea of our project. This helps us to decide the MLX sensor for the accurate result of our project. It also helps in deciding the working of the MLX sensor.

"Internet of Things and NodeMCU" A review of use of NodeMCU ESP8266 in IoT products, Yogendra Singh Parihar gives us overview about the NodeMCU. It tells its application and how to implement and use this device. It also tells us how to connect all the components to NodeMCU and gives us the idea to connect the system to cloud or for the future reference make the system fully automated.

3. FLOWCHART

The flowchart of the system is shown in Fig -1. In this flowchart we can see that the user scans the userid that is registered by the administrator from the RFID tag. It is then read by the RFID Reader Module. Then for the better accuracy the ultrasonic sensor is set to 2 cm. After that the temperature sensor will start reading temperature from the user. This reading is then sent to NodeMCU. The NodeMCU sends the data to webpage where the administrator accesses the database from the webpage after entering the correct credentials from the administrator.

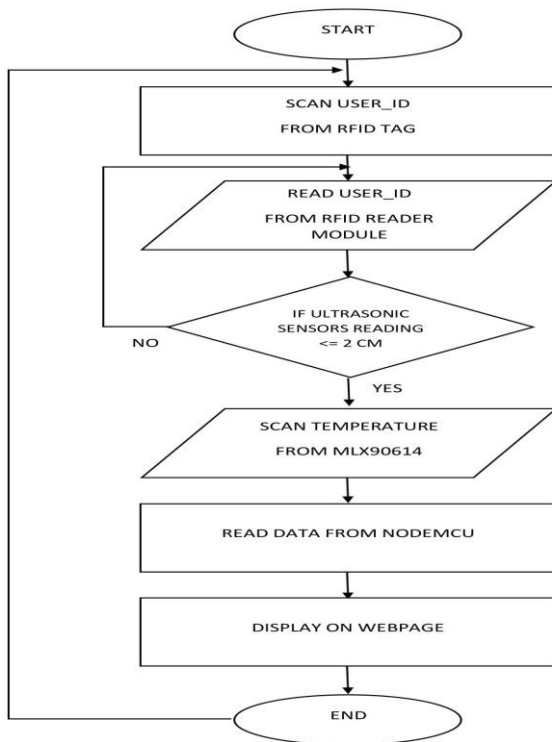


Fig -1: Flowchart

4. BLOCK DIAGRAM AND WORKING

The block diagram of the system is shown in Fig-1. The input modules are Temperature Sensor, Ultrasonic Sensor and RFID Reader Module which communicates from NodeMCU using various communication system. The result from the NodeMCU is then goes to a webpage. Thus, from the webpage it goes to cloud which later helps user to access it from anywhere.

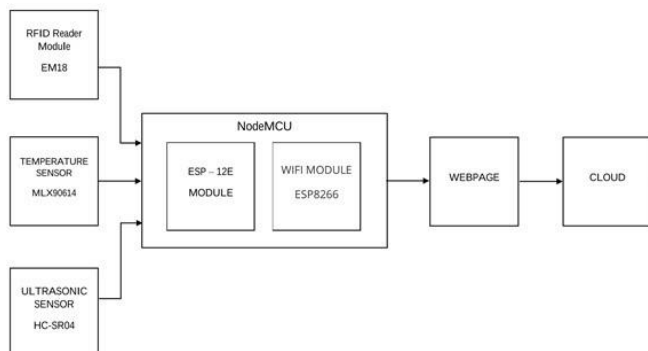


Fig -1: Block Diagram

In this system the xyz person scans himself from RFID tag given to the xyz person given by the admin. The RFID tag register each person identity. The xyz person scans his RFID tag from RFID Reader Module. Then he/she will stand keep hands in front of the ultrasonic sensor. At safe distance without touching anything the temperature sensor will take

his temperature and it will be sent to NodeMCU and stored on the webpage database. The database goes to XAMPP where the database is stored in php file. It is also stored in csv file format for a backup and easy access by the user. Later this database can be accessed by the admin from any device and from anywhere. This system is reliable as there is no data loss and it can access easily.

5. SOFTWARE IMPLEMENTATION

The system can be accessed by the administrator only as it is password encrypted. We can see that Fig -2.

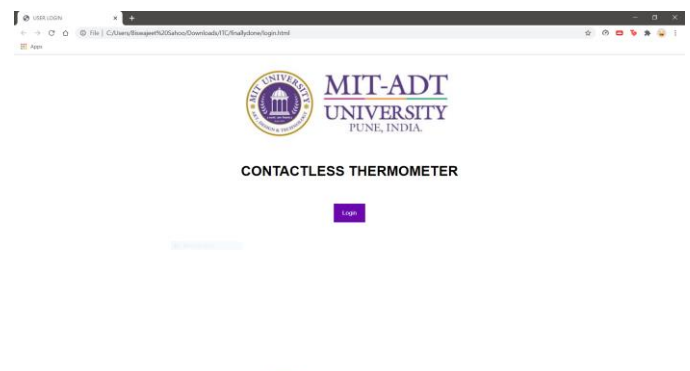


Fig -2: Login Webpage

The Administrator then enters the username and credentials. We can see from the Fig -3.

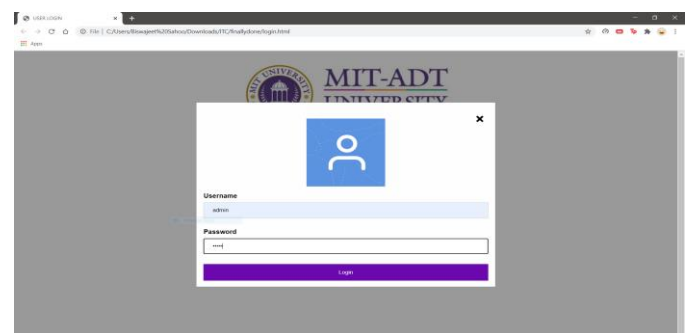
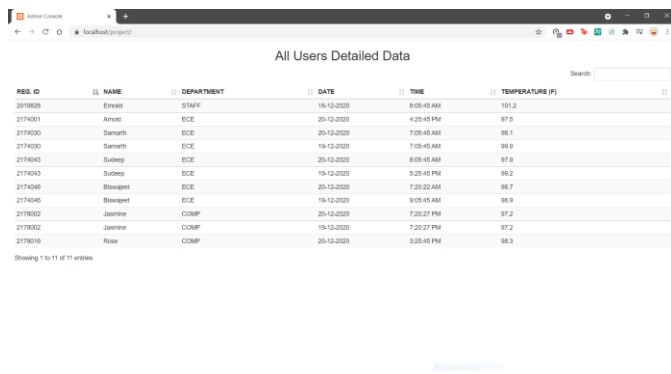


Fig -3: Administrator entering credentials

After entering correct credentials, the administrator can access to databases. It can be sorted by Name, Date, Registered Enrollment Number or Temperature. This will help the administrator to also keep the track of each individual.



RES. ID	NAME	DEPARTMENT	DATE	TIME	TEMPERATURE (F)
217000	Enayat	STAFF	18-12-2020	8:05:45 AM	101.2
217001	Arvind	ECE	20-12-2020	4:25:45 PM	97.5
217002	Samarth	ECE	20-12-2020	7:55:45 AM	98.1
217003	Samarth	ECE	19-12-2020	7:25:45 AM	98.9
217004	Sudhep	ECE	20-12-2020	8:05:45 AM	97.8
217005	Sudhep	ECE	19-12-2020	9:25:45 PM	99.2
217006	Bhuvanet	ECE	20-12-2020	7:20:22 AM	98.7
217006	Bhuvanet	ECE	19-12-2020	9:05:45 AM	98.9
217002	Jasmine	COMP	20-12-2020	7:25:27 PM	97.2
217002	Jasmine	COMP	19-12-2020	7:25:27 PM	97.2
217005	Rise	COMP	20-12-2020	3:25:45 PM	98.3

Fig -3: Result on Webpage

Thus, this database can be access from PC or mobile phone. It can be used in any platform.

6. CONCLUSION

In this project we are trying to build a device which helps to monitor the temperature of the people. It stores the temperature of every individual by the help of the RFID system. Later this stored value can be accessed by the administrator. This whole system is Contactless which reduces the risk of Covid. This device is perfect for situation of covid. Using this device, we can be alert if someone who might be affected from covid. This will help in preventing any spread of the covid. As it is cloud based there is no loss of data and can be accessed anytime anywhere.

7. FUTURE SCOPE

For future work, we can add voice assistant that tells us immediately if some person is infected this way people will be more alert and we can add the cameras that will detect the facemask if not covered will alert and we can add a dispenser system in the beginning that will prevent spread of germs from body contact that will be automated using RFID system after the person scans himself it will eb provided a space where he will wave hands and sanitizer will be sprayed on his hands.

REFERENCES

[1] "The Rfid Technology and Its Applications": A Review Davinder Parkash, Twinkle Kundu & Preet Kaur. International Journal of Electronics, Communication & Instrumentation Engineering Research and Development (IJEIERD) ISSN 2249-684X Vol.2, Issue 3 Sep 2012 109-120

[2] "Design and Implementation of Thermal Body System Employing Thermal Sensor MLX 90614 for Covid-19 Symptoms Early Detector" Puput W. Rusimamto1, Rina Harimurti, Endryansyah, Yeni Anistiyasari, Lilik Anifah Advances in Engineering Research, volume 196 International Joint Conference on Science and Engineering (IJCSE 2020)

[3] "Internet of Things and Nodemcu" A review of use of Nodemcu ESP8266 in IoT products, Yogendra Singh Parihar, Scientist D and District Informatics Officer 1 National Informatics Centre, Mahoba(U.P.), India. Journal of Emerging Technologies and Innovative Research JETIR June 2019, Volume 6, Issue 6.

[4] "RFID Tag as a Sensor - A Review on the Innovative Designs and Applications" Zhaozong Meng, Zhen Li Measurement Science Review, 16, (2016), No. 6, 305-315. ISSN 1335-8871

[5] "Design of Non-Contact Infra-Red Thermometer Based on the Sensor of MLX90614" Gang Jin, Xiangyu Zhang, Wenqiang Fan, Yunxue Liu and Pengfei He. The Open Automation and Control Systems Journal, 2015, 7, 8-20

[6] "Internet of Things (IoT) based Sensors to Cloud system using ESP8266 and Arduino Due" Mr. Nerella Ome, Mr. G. Someswara Rao International Journal of Advanced Research in Computer and Communication Engineering ISO 3297:2007 Certified Vol. 5, Issue 10, October 2016.

[7] A NodeMCU Based Home Automation System Prathmesh Shelke, Shubham Kulkarni, Swapnil Yelpale, Omkar Pawar, Ravdeep Singh, Kirti Deshpande International Research Journal of Engineering and Technology (IRJET) Volume: 05 Issue: 06 | June-2018