iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** V **Month of publication:** May 2021

DOI: https://doi.org/10.22214/ijraset.2021.34039

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue V May 2021- Available at www.ijraset.com

Temperature based Touchless Attendance System considering Covid-19

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Abstract: ***This work introduces a new paradigm of monitoring student attendance using Temp. Scanning, Radio Frequency Identification (RFID) &face scanning based on the Internet of Thing (IoT) Educational institutes are concerned about student irregular attendance. Truancy can affect a student's overall academic performance. The traditional method of taking attendance by calling names or signing on paper is very time consuming and inefficient. RFID (Temperature based Touchless Attendance System Considering Covid -19) based attendance system using IoT system is one of the solutions to handle the problem. The proposed work comprises of most popular trend in technology research in "covid-19"situation; IoT, RFID, thermal scanning, face scanning.***

Keywords: IOT, Temperature Sensor, RFID, Face Recognition

I. INTRODUCTION

Nowadays, it is very important to finish the job fast, learn something new, get higher results as easy and efficiently as you can. Every sector, especially in the education process and in the business world, needs management systems that will enable them to have adequate control and management in the development of learning or work. Considering all these advantages and benefits, we thought that the process of education at the university, in particular, needs an online system to manage student attendance. The concept "Internet of Things" (IoT) has recently attracted growing attention from both academia and industry. IoT is a scenario where devices (even animals or people) are provided with unique identifiers and the ability to automatically transmit data over a network without requiring human-to-computer interaction .RFID forms an essential block of IoT where RFID devices are wireless microchips used for tagging objects for automated identification [3]. RFID systems consist of a reading device called a reader, and one or many tags. The frequency band in which each RFID system operates can be low, high or ultra-high frequency. The low-frequency band (LF) covers frequencies from 30 KHz to 300 KHz. Regularly LF RFID systems work at 125 KHz [4]. The high band (HF) ranges from 3 to 30MHz. Most HF RFID systems work at 13.56 MHz with reading ranges between 10 cm and 1 m. The ultra-high frequency band (UHF), recurrence band, covers the reach from 300 MHz to 3 GHz [5]. The reader is a powerful device with a lot of memory and computational resources which could be connected to Raspberry Pi. The RF SAW system provides temperature sensing capabilities Temperature sensors have been integrated with traditional passive RFID tags. The majority of the state of the art with regard to integration of sensors with RFID technology has been in relation to active RFID systems, where the sensor node and RFID tag are powered locally, typically from a battery source. Can operate in extremes of temperature compared to chip-based tagsResilience to radiation, meaning that they can survive sterilizations processes such as gamma-ray and ebeam. The main working principle of the project is that, the captured data is converted into image to detect and recognize it, along with their scanned rfid tag and their body temperature, else the system marks the database as absent. The task of the proposed system is to capture the face of each student and to store it in the database for their attendance. The face of the student needs to be captured in such a manner that all the feature of the students' face needs to be detected. There is no need for the teacher to manually take attendance and through further processing steps the face is being recognized and the attendance database is updated. The system will help a lot in improving student attendance in particular courses they need to attend and will save a lot of time. This paper consists of three sections: the first part deals with the related papers; the second part details the proposed framework; and the last part details the implementation plan accordingly.

II. RELATED WORK

In this section, we review a few related systems and their different methods in recording students' attendance. An RFID based system [1] is developed to record students attendance during class hour as the students enter the class. This system requires each classroom to be installed with an RFID reader that is connected to a computer. The RFID reader will be used to capture the student information through the student's card. To view the overall student attendance, the lecturer may later connect their phone via Bluetooth to the computer.

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A. Problem Statement

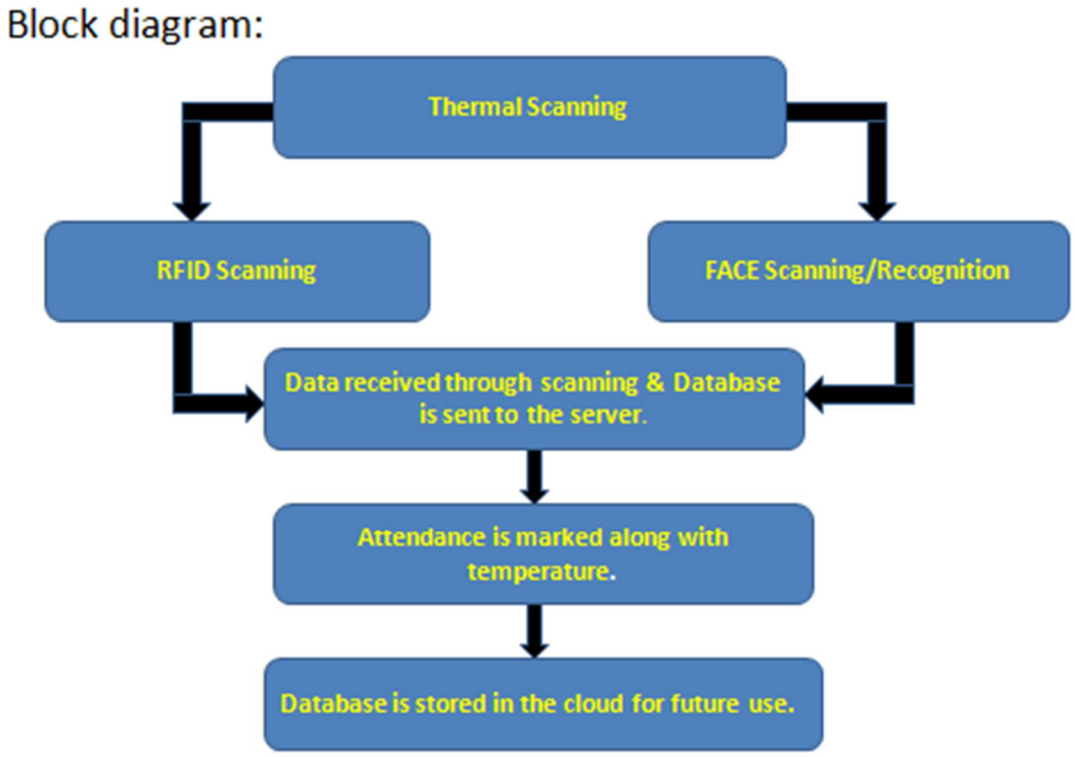
"Switch off" Biometric Attendance on March 5th 2020 Delhi government announced the suspension of biometric attendance in it's offices via letter written to principal secretaries, secretaries, autonomous bodies and municipal corporations for the suspension of biometric attendance to contain the spread of coronavirus. However, it was on Feb 17th 2020 when Maharishi Valmiki Hospital in the Capital City of India suspended biometric attendance announcing it as a "precautionary measure" after many of it's employees complained to the authorities that touching the biometric system is "psychological unease" on account of coronavirus scare .Need of the system is untouchable device .And also student can't cheat with the system. For that we have a solution of face recognition. Seeing the situation of covid19 along with attendance temperature scanning is very important. Without any physical contact of human etc.

III. PROPOSED SOLUTION

After the COVID-19 outbreak, the contactless temperature measurement devices are getting very popular and most of them use the infrared temperature sensor. But we need help of the human to use or operate such device at a very small distance and it's dangerous for them too. The solution is that our device measures the temperature of the person without any physical contact. It can measure human body temperature with a non-contact infrared temperature sensor and If necessary at and event Or school where we can get the database of the human so can configured it with our device and Face recognition and tag scanning process is send and the Name and Temperature of that human to a webpage that can be monitored from anywhere using the internet.

IV. DESIGN FRAME WORK

Figure shows the basic design block diagram of SAS(Temperature based Touchless Attendance System Considering Covid -19). The entire system comprises hardware and software. The function of the hardware is to scan the temp. First &then identify the tag ID by reading a signal generated by the tag & scan the face. The tag information will be sent out to the database and then to the software application for further data analysis and processing. The software is responsible for performing the task concerning the database, processing of data and providing output in the form of reports and graphs. Once data is collected and stored in the database, lots of services could be used.



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V. HARDWARE

To be implemented.

A. NodeMCU ESP8266
B. EM18 RFID Module
C. MLX90614 Infrared Thermometer
D. Raspberry pie-4
E. Arduino
F. OLED SSD1306
G. Ultrasonic Sensor
H. Face recognition

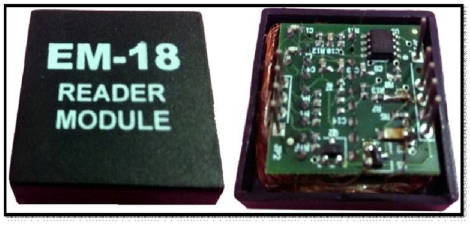


Fig.1 EM18 RFID Reader Module

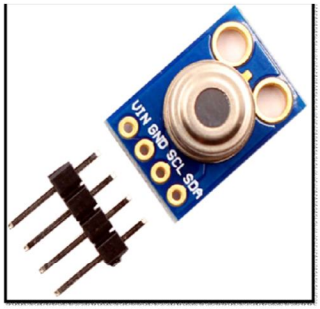


Fig.2 MLX90614 Infrared Temperature Sensor

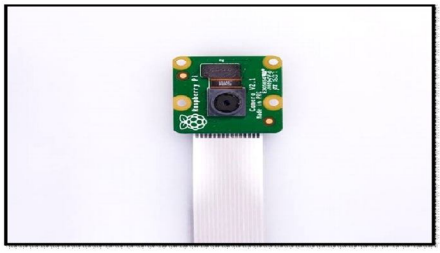
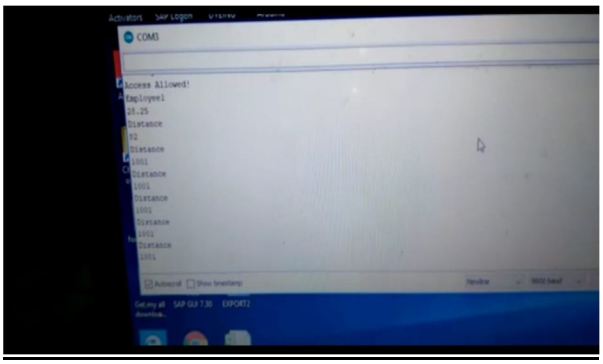


Fig.3 Pi camera(rasberry pi camera)



VI. RESULT



The above mentioned table is our expected result of our project .Each subject's body temperature.

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Vital parameters	Standard ranges
Temperature	35°C-39°C

VII. CONCLUSION

This system is a perfect solution to help reduce the spread of viruses in every access point, in any premises and public areas such as modern workplaces, hospitals, factories, schools, commercial buildings, metro stations, and shops, etc. Because of instant and accurate detection without the need for contact of the body temperature. And with the face recognition and tag scanning people can't cheat with the system.

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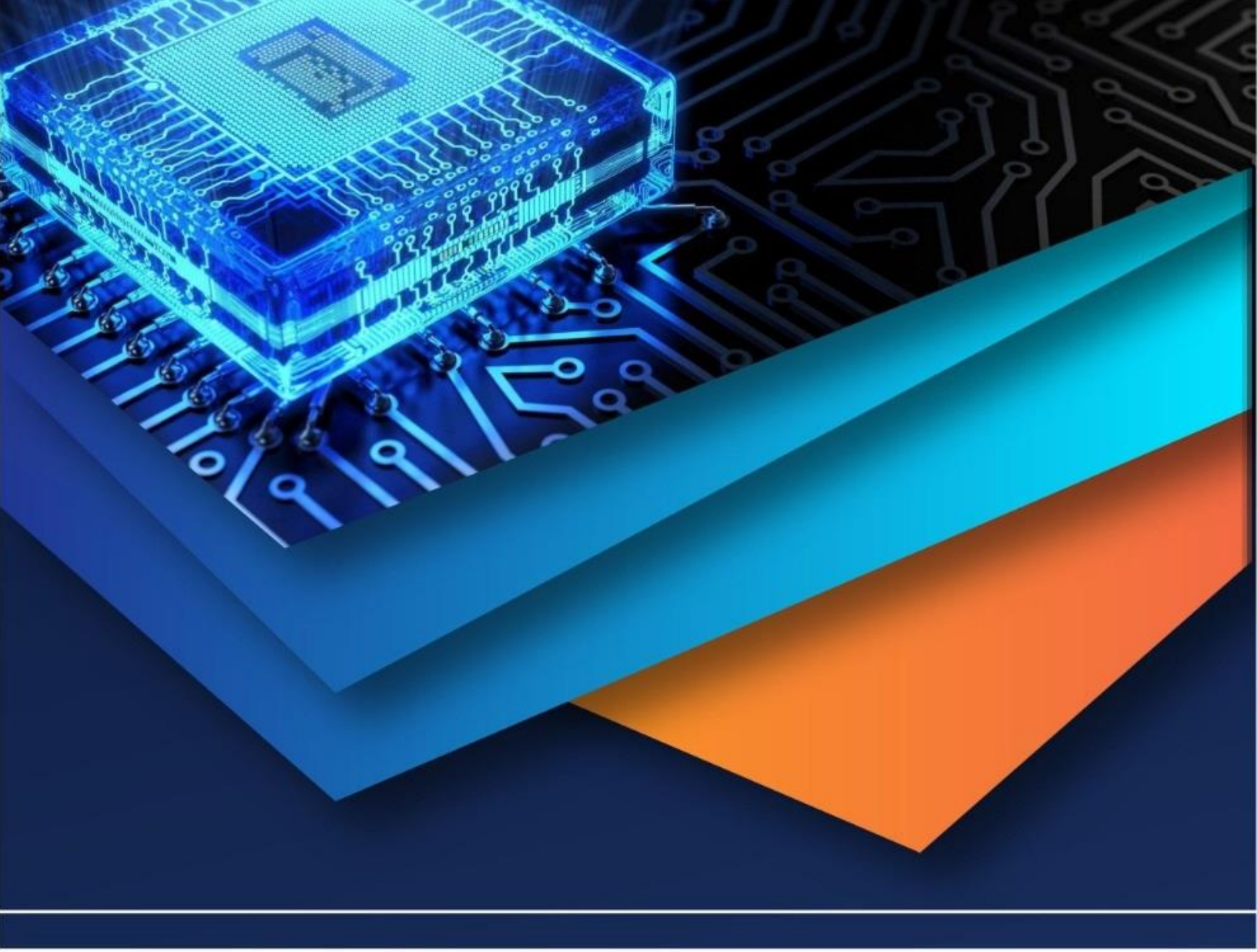
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