



IOT Based Body Temperature Scanning with Biometric attendance Machine

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Abstract: In this paper, one of the criteria to measure student learning outcomes is to ensure consistency. Generally, attendance at school or university is shown by calling your name or registration number to show your attendance in the register. Practice maintains a diary to track student and practice component usage. Either way it takes time and you have to work with more documents. As a result, educational institutions have begun to use biometrics-based student attendance grading systems such as wireless technology and fingerprint reading. Face recognition with RFID tags. In the current situation due to Covid-19 infection, fever check is very important for students to be able to attend the course. In addition to facial recognition, we brought up the idea that a temperature test was added to the attendance scoring system. The system is designed using an ultrasonic sensor, an infrared temperature sensor and a camera module that is interfaced with the Arduino. This way, at the time the automatic attendance is displayed, the system can scan each student to identify potential Covid-19 patients.

Keywords: Image capturing and Notification, Body temperature sensor, Node MCU, Arduino Uno, Safety and Security.

I. INTRODUCTION

We have a state-of-the-art biometric system with temperature analysis to ensure the safety of human-borne infectious diseases that compromise the health security of tissues. You can pre-configure the system with filters for employees with higher-than-normal body temperatures. Body temperature can be read in a variety of ways, new or non-contact thermometers are used to measure a person's body temperature using a variety of contact and non-contact devices or systems. Various precautions are being taken around the world to reduce the risk of new infections and reduce the spread of the virus.

These include local, national and international travel restrictions, bans on group gatherings, encouraging physical distancing, remote work and education, and strict quarantine policies. Covering the face or wearing a mask and improving hand hygiene play a greater role in student performance. Demonstrates student commitment to learning. Almost all universities and educational institutions have strict rules about attendance. Students must maintain the above attendance rate to take the final exam. Therefore, teachers and teachers in each lesson need to record attendance.

II. LITERATURE REVIEW

[1] Nowadays Today's medical environment has advanced science and knowledge based on directional wireless sensor node technology. Patients face the problem of unexpected death from certain causes of heart disease, and the pain is due to the lack of adequate treatment for the patient at the time it is needed. This includes special monitoring of elderly patients and notifications to doctors and relatives. Therefore, we propose an innovative project that uses sensor technology to monitor patient health and prevent these sudden deaths by communicating with loved ones via the Internet in case of problems. The system uses temperature and heart rate sensors to monitor the patient's health. I have two sensors connected to my Arduino-una. To monitor the patient's health status, the microcontroller is connected to the LCD screen and connected to Wi-Fi to send data to the Web server (wireless sensor node). When a patient's heart rate and body temperature change rapidly, IoT sends an alert to the patient. The system also displays the patient's body temperature and heart rate from internet timestamps. Therefore, IoT-based patient health monitoring systems use the Internet to effectively monitor patient health and help users keep track of the work of loved ones and save lives. Modern healthcare systems introduce new technologies such as wearable devices and the cloud. Provides flexibility when recording patient monitoring data and sending it remotely via IoT.

[2] The COVID-19 flu, which started in Wuhan, China in December 2019, has brought a new era and a new way of life. The global level of infection is 15,012,731 In addition to confirmed cases and 619,150 deaths [3] and a significant increase in infections and deaths across the country, the Philippines requires control and prevention of COVID-19 for wearing a mask, and due to the possibility of viral infection, social distancing of 1 meter between



[3] individuals is mandatory. You must keep your distance. It takes place through saliva and human contact. A big challenge in stopping the spread of COVID-19 is maintaining social distancing, especially in public places. So, I designed an automatic gateway and thermometer using ultrasonic sensors, infrared and infrared thermometers to control the Arduino Uno. In the case of COVID-19 confirmed in the Philippines [1], the Philippines is taking more stringent precautions, especially with the resumption of commercial and government activities.

III. SYSTEM OVERVIEW

Initially, photos of all students are captured and updated in the database. So, every time a student attends a class, we use an automatic grading system. The ultrasonic sensor module detects the distance between the student and the device. If it is within the specified range, the image is captured and compared to the stored information. When a student's face is recognized, the temperature sensor is used to read the temperature and record the student's details such as ID, timestamp and temperature. Continue searching for the next student. Text messages and email notifications are sent to the instructor or responsible manager when an unknown person attempts to enter the classroom. These notifications are also sent when a student's body temperature is higher than normal. Because it uses facial recognition, it acts as the first layer of security and does not open the door to unauthorized persons. Students will not be allowed to attend by proxy as the images and dates are time stamped. Since the system implements a non-contact thermometer, people with an elevated body temperature are not allowed to enter. This will limit the spread of the disease to other students. Even if you forget or lose your student ID, you can verify your identity with face authentication. Instrumentation is carried out at low cost, allowing the development of cost-effective non-contact thermal inspection and timing systems.

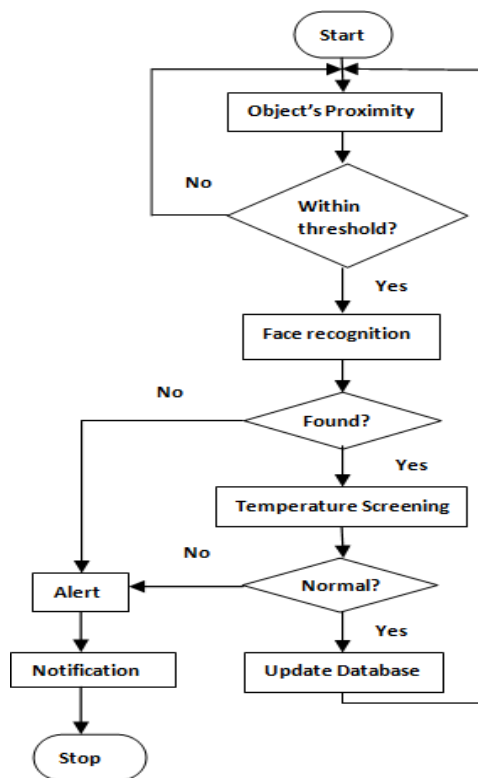


Fig. 1 Flowchart Existing System

IV. METHODOLOGY

We Improve the system to control the door through the mask. So, let's explain how it works. Manage the ability to use our face system expanding the doorway. So, let's explain how it works. Currently implemented. A. Show the data connection is shown in the image. This section simply explains the main connections.

1) Ultrasonic preferred technology with Arduino to identify students to implement this system. Ultrasonic devices quickly and can provide a total effect when compared to other devices devices. This sensor pulled out ultrasound through triggers such as things or people closing the device. Ultrasonic waves are considered and then reserved for the electrical signal that will be received by the ultrasonic device. Distance can be calculated remotely = fast time. The



ultrasonic sensor measures the measurement machine that all devices have signs of signs. Here we use the Inventory of the HC-SR04 ultrasonic sensor. There are 4 folder devices connected to the connection and the two pins have 1 VC volts and GND (below).

2) OV7670 camera module - when students up to 40 centimeters, the image is captured through the camera. There are 4 photos on this camera. * REXD (A) * Phone) * Word-5 Volvos VC. 3) Temperature equipment is dominated by space - this precious energy water is completed on the rain to detect temperature. Ten bars have been rediscovered in sensors with electrical signals that can be displayed in temperature. Bube is used to remind that the temperature is more than normal temperature, you need to make a list of data on the gray scale of people who are allowed to enter. To make a series of data, this program uses a camera to record more than 50 images, replace these photos in Grayscale, and save instead of this person. The official assembly used by the Ministry of 2560 is preferred. The entry number is written to Ardafea's room. Every time you move to look forward to Marduno, Ashdine card is turned off and provides a plan that includes ultra-sons. Unlike the corridor, this frame has the opportunity to maintain the owner and is different if it does not enter the sand. Images are stored in the cloud for the future. In this way, the information you need to see will be stored in the Cloud. The use of this system is a battery battery for use with doors and hold.

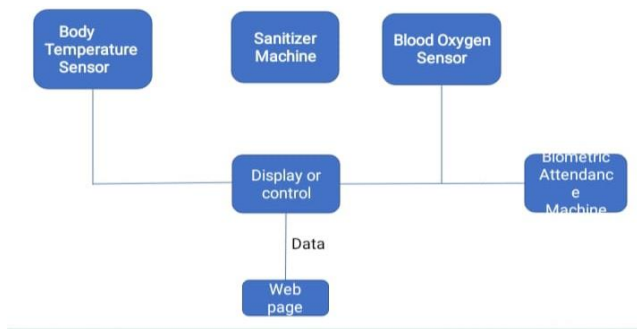


Fig. 2 Block Diagram

These products need to improve applications separated by the Smart Gate system for communication problems. We provide systems such as computer tools and computer tools that can be distributed, including complex systems. ... it's not on the basis, these photos have pictures to distinguish people. People are resting at home and trying to maintain their owners. In this way, the appropriate data is stored in the Cloud for the next search.

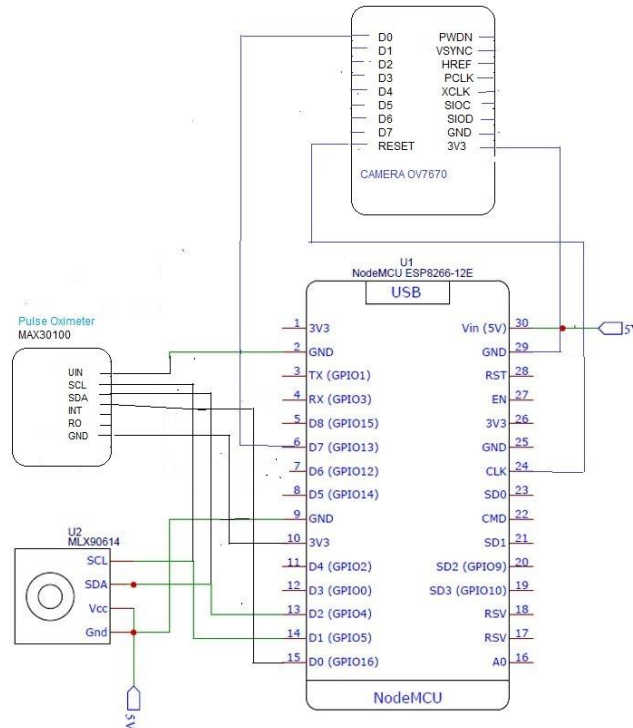


Fig. 3 Circuit Diagram



IV. HARDWARES

A. Body Temperature Sensor: -

The MLX90614 is an infrared radiation thermometer for non-contact temperature measurement. ... By default, 10-bit PWM is configured to continuously transmit measured temperatures in the -20 to 120°C range with an output resolution of 0.14°C . The MLX90614 provides accuracy standard $\pm 0.5^{\circ}\text{C}$ at room temperature. There is a special version for medical use that provides $\pm 0.2^{\circ}\text{C}$ accuracy over a limited temperature range close to human body temperature. The working principle of the MLX90614 infrared sensor is to convert the infrared signal collected by the object and body into an electrical signal, send the electrical signal after being processed by the amplifier to the converter, and the range The microscopic measure of the temperature of the object is -70 to 382.2°C (-94 to 719.96°F), ambient temperature measurement range is -40 to 125°C . With a resolution of 0.02°C for ambient and object temperatures, the electrical signal is converted converted to a digital signal and stored.



Fig. 4. Body Temperature Sensor

B. Node MCU -

Node MCU is open-source firmware that allows you to use open-source prototyping board design. The firmware uses the Lua scripting language. The firmware is based on the eLua project and on the Espressif SDK not the ESP8266 OS. It uses many open-source projects such as lua-cjson and SPIFFS. The MCU node has 128 KB of RAM and 4 MB of flash memory to store data and programs. High processing power with Wi-Fi / Bluetooth and built-in Deep Sleep Executive function is ideal for IoT projects. MCU node can supply power to Micro USB port and VIN (external power pin). Supports UART, SPI and I2C.



Fig. 4. Node MCU

C. ARDUINO UNO -

It is a smaller, more powerful, easier and cheaper device that can perform more tasks, smaller and more expensive work functions to take up more space. Microcontrollers were introduced in the electronics industry with the aim of simplifying operations through remote connectivity and automation in all aspects. Microcontrollers are used in integrated systems to ensure that the device continues to operate as needed and required. Included in electronics including USB cable, 14 digital I / O numbers, 6 analog pins and Atmega 328 microcontroller, it also supports serial communication via Tx and Rx. There are different types of Arduino display models on the market, including Arduino ONE and IOT.



Fig. 4. ARDUINO UNO

D. CMOS Camera image sensor -

OV7670 The OV7670 640X480 VGA CMOS camera sensor model is an inexpensive DSP image sensor capable of operating at resolutions of up to 30 fps and 640 x 480 ("VGA"), equivalent to 0.3 megapixels. The captured image can be pre-processed by DSP before transmission. This preprocessing is configurable via the Serial Camera Control Bus (SCCB). OmniVision OV7670 CMOS VGA (640 x 480) CMOS sensor with OmniPixel technology Input voltage 3.3V DC. Temperature day. 0-50 degrees Celsius, all lenses, lenses made of magnesium alloy (including sheets). The focal length of the lens is 3.6mm 650nm Strips Black FR-4 PCB, Quality Heavy Gold Plate effectively prevents the problem of light leakage of PCB and prevents shadows in the image. 2 x Output Connector 10 0.1 Easy to mount on prototype board, breadboard, . integrated MCU Connecty camera module is powerful and easy to connect with 8/16/32 bit microcontroller. The OV7670 640X480 CMOS VGA sensor module provides visibility for small embedded systems and is useful for many robot applications.

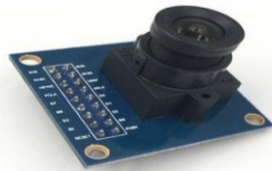


Fig. 4. CMOS Camera image sensor

V. RESULT AND DISCUSSION

The ultrasonic sensor module detects the distance between a student or faculty member and the device. If it is within the specified range, the image is captured and compared to the stored information. Once the student's face is recognized, a temperature sensor is used to read the temperature and record student details such as ID, time stamp, and temperature. Keep looking for the next student. Next, check the oxygen levels in the student's blood. THE FIGURES. The behavior of the system using facial recognition.



Time	Name	Temperature (° C)
6:34:58 PM	Employee1	37.29
6:34:56 PM	Employee1	36.85
6:34:53 PM	Employee1	34.83
6:34:51 PM	Employee1	34.71
6:34:46 PM	Employee1	37.69
6:34:44 PM	Employee1	34.77
6:34:42 PM	Employee1	34.71

Fig. 4. CMOS Camera image senior

VI CONCLUSION

The system proposed above is designed on the basis of sound and multi-layered security principles. It integrates facial recognition technology and thermal inspection and does so at low cost. Everything is cheap. The system is implemented to maintain safety and health with the main concerns, therefore alert emails, text messages will be sent to administrators and whistles will sound. It can be used in schools, universities and offices where safety and health are paramount. The proposed non-contact time and heat control system using Arduino will not only be used for timing and thermal testing, but also for dictionary security checks. This system is used to verify the identity and health of students and faculty. In the future, this could be improved by adding a direct voice call interaction from the manager to the device when a stranger comes.

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