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Novel Covid-19 Detection and Diagnosis System Using IoT Based Smart Entrance

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ABSTRACT: This paper mainly focuses on detecting covid symptomatic people outside the door i.e. at entrance and taking preventive measures so that a bunch of people inside offices, universities, schools, colleges are safe from inflectional diseases. This system will be located at the entrance with a buzzer, flash LED, camera, etc. System is designed to detect the temperature of the entering person. As we know, this is ongoing phase 2.0 of Covid wave various symptoms are found in different cases but among all temperatures is a common issue. We can say detecting temperature is not a big deal in front of covid virus but bit by bit will make a big difference.

KEYWORDS: Temperature detection, Health monitoring system, Data storage of detected person.

I. INTRODUCTION

Due to upcoming 5G Technology internet devices are evolving day by day. As in protocol this system uses raspberry pie which an on board computer connected to the internet. Raspberry pie has the capacity to process the image frame which are clicked on victims so boards like Arduino and development boards won't survive in such a project due to Wi-Fi, camera interfacing and processing capacity of Raspberry Pie. Considering IoT, in recent years, the Internet of Things (IoT) has gained convincing research ground as a new research topic in a wide variety of academic and industrial disciplines, especially in healthcare. So the combination of IOT and on board computer is used to illustrate the prototype.

II. LITERATURE SURVEY

The World Health Organization (WHO) officially announced that a new virus had been identified which was then called by 2019-nCoV on January 2020. The first reported case was from Wuhan, China. It has infected 7,711 people and 170 reported deaths in China Someone who infected by coronavirus will show common symptom such as fever, dry cough, and tiredness or some cases, infected person will feel pains & aches, runny nose sore throat, nasal congestion, or Diarrhea The name of Coronaviruses was taken from Latin term 'corona', that means crown, since they are encompassed by what look like royal crown of a spiked shell shape. The virus was recognized as part of the coronavirus group, which involves SARS and the other known colds. . However, some people infected with the virus do not show any symptoms and do not feel uncomfortable. Around 80% of individuals infected by COVID-19 can get recovery without acquiring particular treatment, but it is so dangerous for older people or someone with a serious illness that the probability for them to get a serious illness and develop difficulty breathing are higher. Right now, no effective vaccine for COVID 19 was produced or particular medication for treatment such virus was developed. However, potential vaccines and some particular medicine treatments are still under investigation and now being subjected to comprehensive tests by leading medical research centers. Further, extraordinary efforts are coordinated by WHO to develop and produce effective vaccines and drugs to avoid and treat COVID-19. As the reported case of death and infected people keep increasing, many nations have performed lockdown to minimize the spread impact of coronavirus.

III. METHODOLOGY

The smart system is equipped with one type of camera, allowing the gathering of detailed information of the face detection details and temperature measurements taken by the MLX90614 IR Temperature Sensor. Optical camera and infrared thermal sensor which provided information about the temperature at which the different focuses of interest were found. The MLX90614 is an infrared thermometer for non-contact temperature measurements.Both the IR sensitive thermopile detector chip and the signal conditioning ASIC are integrated in the same TO-39 can. Integrated into the MLX90614 are a low noise amplifier, 17-bit ADC and powerful DSP unit thus achieving high accuracy and resolution of the thermometer. The thermometer comes factory calibrated with a digital SMBus output giving full access to the measured temperature in the complete temperature range(s) with a resolution of 0.02°C. The user can configure the digital output to be pulse width modulation (PWM). As a standard, the 10-bit PWM is configured to continuously transmit the measured temperature in range of -20 to 120°C, with an output resolution of 0.14°C. This module regards the segmentation approach of an image according to the recorded temperature and captures color images by both thermal and optical cameras. Thermal cameras are utilized for hot body detection and recognition by adopting the variability of high temperature compared with other objects within the scanned zone. If a thermal camera visualizes a high temperature body, then it creates high intensity levels of infrared spectra. The camera module is Raspberry Pi Camera Board plugs directly into the CSI connector on the Raspberry Pi. It's able to deliver a crystal clear 5MP resolution image, or 1080p HD video recording at 30fps! Latest Version 1.3! Custom designed and manufactured by the Raspberry Pi Foundation in the UK, the Raspberry Pi Camera Board features a 5MP (25921944 pixels) Omni vision 5647 sensor in a fixed focus module. The module attaches to Raspberry Pi, by way of a 15 Pin Ribbon Cable, to the dedicated 15-pin MIPI Camera Serial Interface (CSI), which was designed especially for interfacing to cameras. The CSI bus is capable of extremely high data rates, and it exclusively carries pixel data to the BCM2835 processor. The board itself is tiny, at around 25mm x 20mm x 9mm, and weighs just over 3g, making it perfect for mobile or other applications where size and weight are important. The sensor itself has a native resolution of 5 megapixel, and has a fixed focus lens onboard. In terms of still images, the camera is capable of 2592 x 1944 pixel static images, and also supports 1080p @ 30fps, 720p @ 60fps and 640x480p 60/90
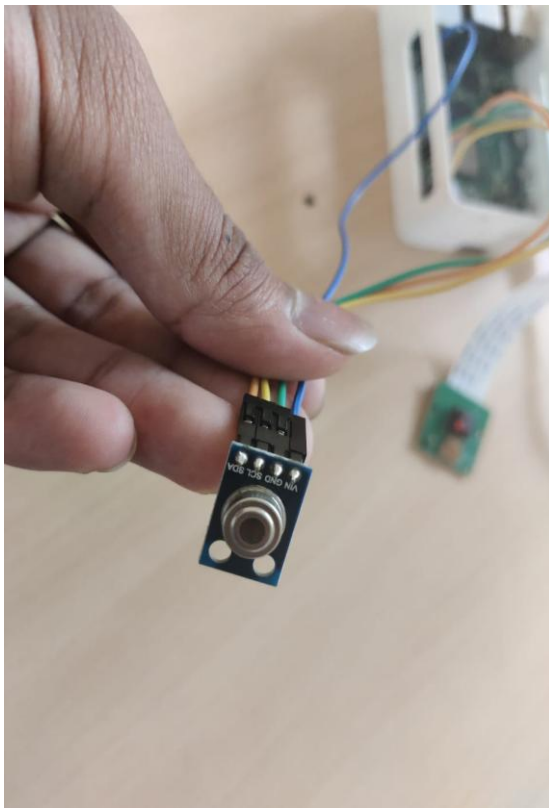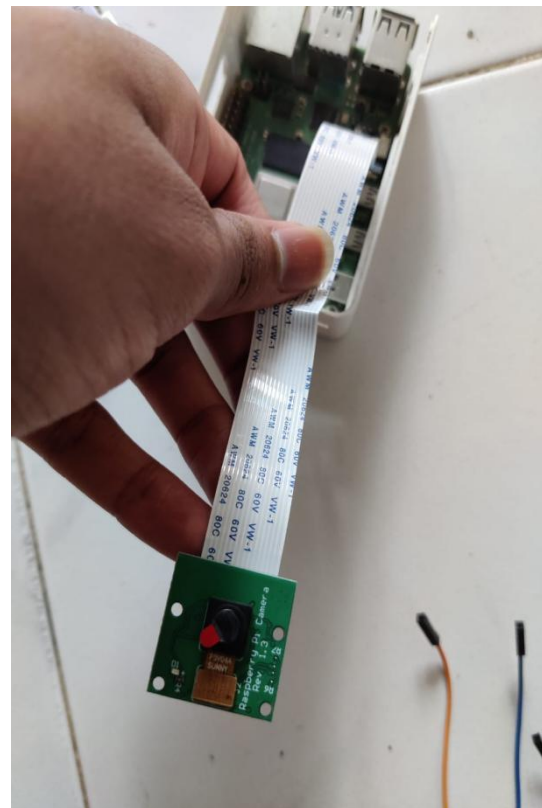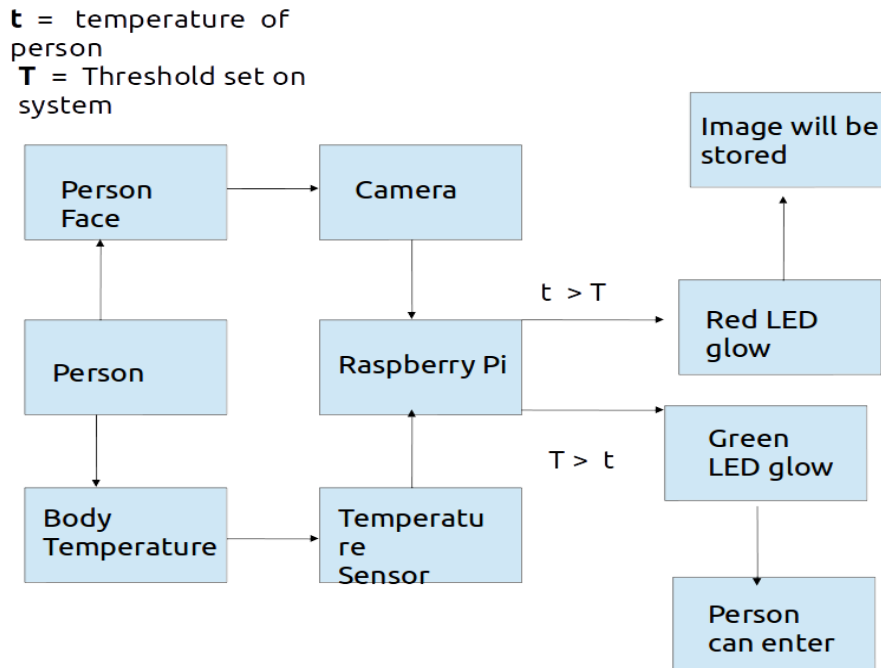

Fig. 1. MLX90614 IRSensor   Fig.2. Camera Module

IV. FLOW CHART

t = temperature of person
T = Threshold set on system

V. PROPOSED SYSTEM

Fig. 3. Raspberry pi

As we know after such a pandemic covid situation bit by bit every city is unlocking the lockdown so small shops, malls, schools, universities, industry, offices, etc. are opening but the risk level of affection is still high due to air spread of disease. We cannot eliminate the whole covid virus directly but we can innovate some technologies to prevent such fatal disease. This system mainly focuses on developing a system at the entrance to detect symptoms of the virus. Our system simply detects an individual's temperature of human and various etc. symptoms and if the person is found to be a victim photo is clicked and database is collected and analysis can be done of victims. Also, such data can be handed over to health care departments. So Raspberry pie is used as the processor to process and control data from input and output. Input module consists of an IR temperature sensor and Pie camera while the output module consists of a buzzer or LED to flash out the state of the human. Also, the system uses SMTP PROTOCOL and Gmail service to create the database.

VI. CONCLUSION

- After execution of our system temperature above 98.6 degrees Fahrenheit is detected we assume the person as feverish or victim and the person is not allowed inside also the camera clicks image of victim and database is handed over to the health care department for covid testing and vaccination.
- On detection if a person is found to be okay, then the person is allowed inside with a green LED flash.

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