IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 6, June 2021

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.542

9940 572 462 | 6381 907 438 | ijircce@gmail.com | www.ijircce.com

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542 |

|| Volume 9, Issue 6, June 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0906015 |

Face Mask Detection with Temperature Checking and Sanitization using Raspberry Pi

[1]Mrs.M.Jyothirmai, [2]K.Supraja, [3]S.Indu, [4]JL.Likhitha, [5]A.Shashank

[1]Associate Professor, Department of Electronics and Communication Engineering, St. Peter's Engineering College, Hyderabad, Telangana, India.

[2,3,4,5]UG Student, Department of Electronics and Communication Engineering, St. Peter's Engineering College, Hyderabad, Telangana, India.

ABSTRACT: In late 2019, Coronavirus Disease 2019 (COVID-19) broke out, causing millions of lives and businesses in distress by 2020 as the world recovers from the pandemic and plans to return to normal, there is a wave of fear beneath all persons, especially those who intend to resume the activity in person. Studies have shown that wearing a mask significantly reduces the risk of virus transmission and provides a feeling of protection. It is not possible to manually track the implementation of this policy. Technology is key here. We are introducing a deep learning-based system that can detect cases where face masks are not being used properly. Our system consists of an OpenCV and Tensor-Flow architecture that can recognize masked and unmasked faces and can be integrated into Raspberry Pi and USB camera. This will help track security breaches, encourage the use of face masks, and ensure a safe work environment. MLX90614 is used to measure human temperature without contact. Temperature below the threshold will open the door otherwise closes door. The infrared sensor detects when the disinfectant is switched on or off.

KEYWORDS - Raspberry Pi, USB Camera, MLX90614, DC Motor, Relay, DC water pump and IR Sensor.

I.INTRODUCTION

In the last few days of last year, the emergence of a new infectious flu has affected every aspect of life, which is a respiratory disease like Covid-19 caused by the SARS-Cov-2 virus (also known as the coronavirus). People all over the world [1]. Symptoms of coronavirus disease include fever, fatigue, sore throat, nasal congestion, loss of taste and smell. The first in detecting COVID-19 is scanning for a fever. We also need to screen each person for a mask. We have temperature control system for each input to be scanned, but manual temperature scanning has many drawbacks, and the staff is not good either trained in the use of temperature sensing [2]. The scanning is skipped through the employees if supervisors are not watching. There is huge chance for escaping. Manual process is not appropriate for massive crowds. To resolve this problem, we are going to design a totally automated temperature scanner and access provider device. It is a multipurpose device that has a variety of applications [3]. The system uses a non-contact temperature scanner and mask monitor. The person is permitted inside if he satisfies both the conditions [4]. To control the operation, camera and temperature sensor are connected to Raspberry Pi. This system offers a fully automated system to prevent the spread of COVID.

II.LITERATURE SURVEY

[5]. **Mohammad Marufur Rahman, "An Automated System to Limit COVID-19 Using Facial Mask Detection in Smart City Network".**

In this paper, a system that will limit the growth of COVID-19 by finding people who do not wear face masks on a smart city network where all public places are monitored with CCTV cameras is designed. If a person is recognized without a mask, the relevant authority is informed via the city network. A deep learning architecture is trained on a data set consisting

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542 |

|| Volume 9, Issue 6, June 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0906015 |

of images of people with and without masks, taken from various sources. The accuracy of the proposed system is 98.7% on differencing the people with and without masks Our study is expected to be a useful tool in reducing the spread of hazardous disease COVID-19.

[6]. **Nenad Petrović, "IoT-based System for COVID-19 Indoor Safety Monitoring**".

In this paper, author proposed an IoT-based system aimed at helping organizations comply with COVID-19 safety rules and guidelines to reduce the spread of the disease. It focuses on the most common indoor measurements: people with high body temperature should stay at home, the use of a mask is mandatory, and the distance between people should be at least 1.5 to 2 meters. For the first scenario, the Arduino Uno microcontroller card with non- contact temperature sensor is used, while for two more scenarios we rely on the Raspberry Pi single-board computer equipped with a camera for computer vision techniques: Python version of OpenCV, Open-source computer vision library. It was used for implementing mask recognition algorithms and checking social distances.

[7]. **Abhinandan Sarkar, "Design of automatic hand sanitizer with temperature sensing"**

Here are two systems working at the same time: the primary one is the computerized sanitizer and the second is the temperature checking. The PING SEN136B5B ultrasonic sensor is used to identify the human range and PIR sensor is used to monitor human movement. Each time when a person is detected, the sanitizer pump1 is activated and sanitizer is sprayed and distributed to the environment with a fan. The ultrasonic sensor has a range of less than 30m. The hand when held in this area activates the pump2, which disinfects the hands with a DC motor. The TMP 36 temperature sensor detects the temperature as quickly because the touch is made, the sensor presentations the temperature at the LCD in Fahrenheit a RGB LED will glow green when the temperature is normal, otherwise it will glow red.
The device has efficient computerized sanitizing but does not offer a non-contact temperature measurement unit that can lead to the spread of an infection.

[8]. **Enerst Edozie, "Design and Implementation of a Smart Hand Sanitizer Dispenser with door controller using ATMEGA328P."**

In this paper, the ATMEGA328P microcontroller is used to design an automatic hand sanitizer dispenser with door controller. When the sensor detects the hand, the servo motor moves from 0 degrees to 180 degrees and the sanitizer gel is poured on hand. After 2 seconds the servo motor returns to 0 degrees. After sanitizing the hand, the second servo motor gets activated and electromagnetic door opens. It takes 8 seconds to complete the process.
The main disadvantage of this device time taken to finish overall process.

III.PROPOSED SYSTEM

In this paper, an automated system was introduced that covers various relevant aspects such as contactless temperature detection, mask detection and automatic hand sanitizer in order to increase the security of entry of Covid-19. It is a fully automated system that nobody can enter if you are not wearing a mask and having a high temperature. The buzzer alerts the security to this situation when a fail-safe condition is detection.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542 |

|| Volume 9, Issue 6, June 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0906015 |

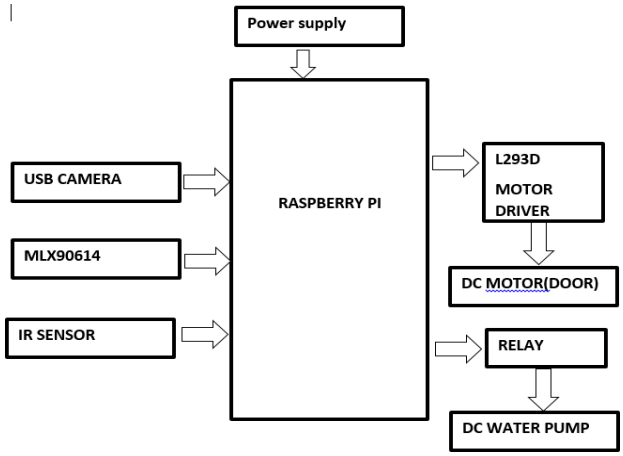

Fig 1: Block Diagram

The proposed system consists of a using Open CV and Tensor flow architecture capable of detecting masked and unmasked faces and are integrated with Raspberry Pi and USB camera. MLX90614 contactless temperature sensoris used to detect the body temperature, Raspberry Pi processer generates signal to lock the door and gives the audible alert through buzzer if the temperature exceeds the average body temperature. After satisfying both the conditions the DC water pump sanitizes the person. This system offers a fully automated system to prevent the spread of COVID-19.

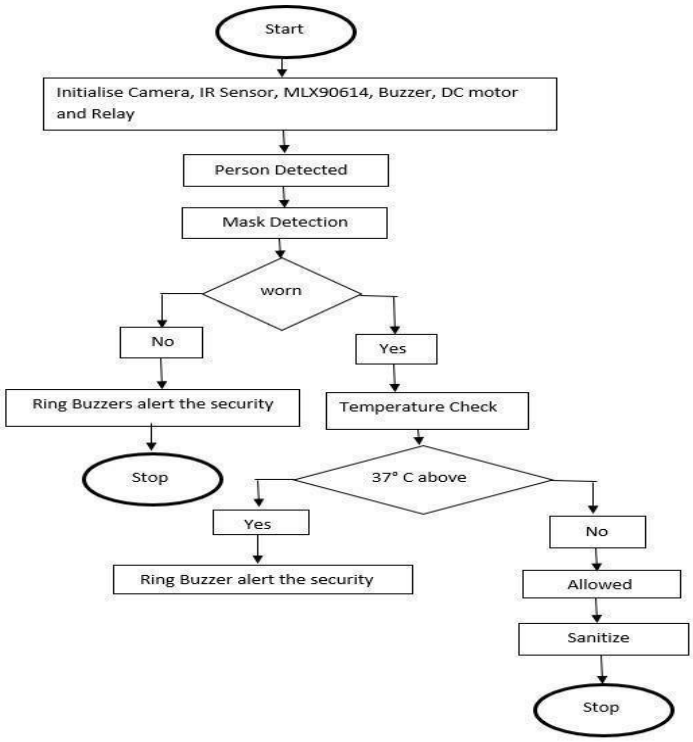

Fig 2: Flow Chart

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542 |

|| Volume 9, Issue 6, June 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0906015 |

IV. RESULT

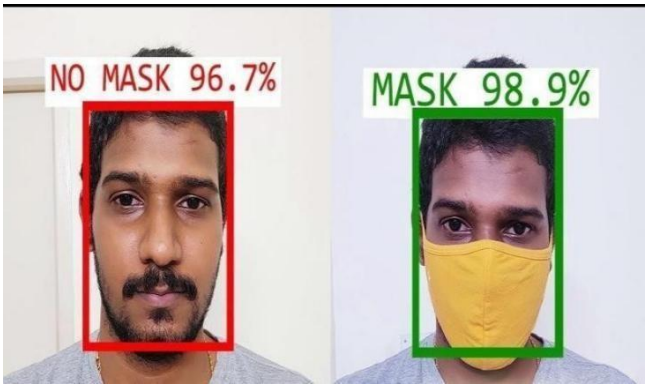

Fig 3: Mask Detection Output

Fig 4: Temperature Sensor Output

V.CONCLUSION AND FUTURE SCOPE

The main goal of this project is to automate the manual work of the Covid-19 hand hygiene protocols, checking the temperature and making sure whether or not people are using a mask. With this system, the spread of the Covid-19 virus can be controlled and the accuracy of the temperature check is higher than with manual execution. The authority of a particular management does not have to deal with the health and nursing concerns of employees or students. In addition, the Inattentiveness of the staff checking the conditions can be corrected by this system. The precision of mask recognition can also be increased in the future, and there is plenty of room for further developments in our project. A number of functions can be added to this system in the future, for security systems and any other breakout prevention system. By reporting the information to government sectors, they can track the prevention of the spread. By using these applications, people can feel more secure and prevent life-threatening situations from affecting the human generation.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542 |

|| Volume 9, Issue 6, June 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0906015 |

REFERENCES

[1]. Karimpour, N., Karaduman, B., Ural, A., Challenger, M., & Dagdeviren, O. (2019, June). IoT based hand hygiene compliance monitoring. In 2019 International Symposium on Networks, Computers and Communications (ISNCC) (pp. 1-6). IEEE.

[2]. Sorto, A., Marquez, T., Carrasco, A., & Ordoñez, J. (2020, November). Face Recognition and Temperature Data Acquisition for COVID-19 Patients in Honduras. In Journal of Physics: Conference Series (Vol. 1710, No. 1, p. 012009). IOP Publishing.

[3]. Huang, Z., Huang, J., Gu, Q., Du, P., Liang, H., & Dong, Q. (2020). Optimal temperature zone for the dispersal of COVID-19. Science of The Total Environment, 736, 139487.

[4]. Bal, M., & Abrishambaf, R. (2017, March). A system for monitoring hand hygiene compliance based-on internet of-things. In 2017 IEEE International Conference on Industrial Technology (ICIT) (pp. 1348-1353). IEEE

[5]. Mohammad Marufur Rahman, Md. Motaleb Hossen Manik, Md. Milon Islam, Saifuddin Mahmud, Jong- Hoon Kim, "An Automated System to Limit COVID-19 Using Facial Mask Detection in Smart City Network", IEEE Xplore, 18 October 2020.

[6]. Nenad Petrović and Đorđe Kocić, "IoT-based System for COVID-19 Indoor Safety Monitoring", Conference Paper, 20 September 2020.

[7]. Abhinandan Sarkar, "Design of Automatic Hand Sanitizer with Temperature Sensing", Volume: 05 Issue: 5 May 2020.

[8]. Enerst Edozie, Wantimba Janat, Zaina Kalyankolo, "Design and Implementation of a Smart Hand Sanitizer Dispenser with Door Controller using ATMEGA328P", International Journal of Engineering and Information Systems (IJEAIS), Volume: 04 Issue: 6 June 2020

INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 7.542

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

Scan to save the contact details