OPEN ACCESS INTERNATIONAL JOURNAL OF SCIENCE & ENGINEERING

SMART DOOR CAMERA WITH FACIAL RECOGNITION FEATURE FOR THERMALSCREENING

Sanket Hake[1], Pratik Kale[2], Dnyaneshvar Dhaygude[3], Sandip Bhise[4], Sachin Kahandal[5]

Electrical Engineering Department, SKN-Sinhgad Institute of Engineering and Technology,Kusgaon(Bk.), Lonavala, India

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Abstract: ***In these times of COVID-19, it is essential to go through thermal screening for checking one's body temperature before entering any premises. However, it is a tiring process as it involves measuring body temperature of all people, one at atime. At the same time, those who carry out thermal screening are required to stand for more than 8 hours a day and check each and every person. This takes a lot of time and effort. So to come up with a solution that can do this job effortlessly, we have built a Facial Recognition Thermal Screening System. The device works by recognizing the face of each person and doing thermal screening to detect the body temperature. If a person is found to have a very high temperature, then the systemwill not allow entry and instead will automatically notify that person to take a COVID-19 test. If the body temperature falls between the required normal temperature range and is found to be okay, then entry is allowed after proper sanitization***

Keywords: *Face Recognition, Covid-19, Thermal Scanning, Raspberry-pi, Thermal Sensor.*

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I. INTRODUCTION

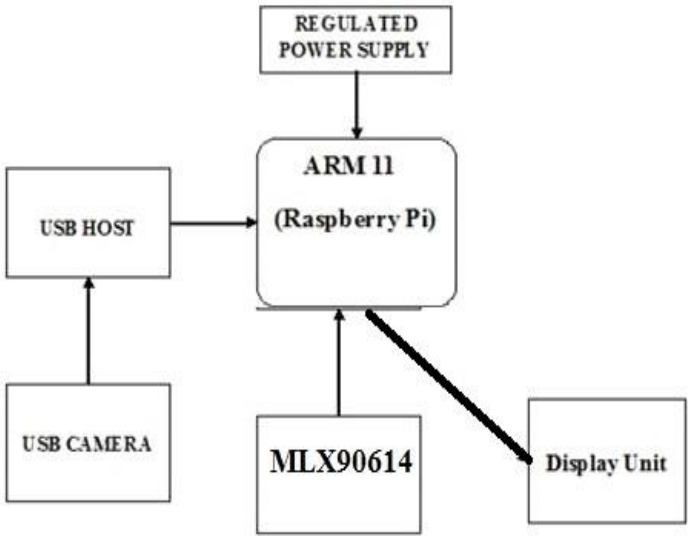
Corona virus disease (COVID-19) is an infectious disease caused by a newly discovered corona virus. This disease can show mild to moderate symptoms and like tiredness, aches and pains, sore throat, fever, difficulty in breathing or shortness of breath, loss of speech or movement, chest pain orpressure etc. This disease gets transmitted from person to person through droplets generated when an infected individual coughs, sneezes, or exhales. These droplets are tooheavy and hence they don't hang in the air, So they settle on floors and surface. When other person comes in contact with these infected surface and thereafter if he touches his mouth, nose or eyes there are high chances to get exposed to this virus.

Due to these situation, many protection and safety measures were taken by governments in order to reduce the disease spread, such as obligatory indoor mask wearing, social distancing, quarantine, self-isolation, limiting citizens' movement within country boarders and abroad, often together with prohibition and cancellation of huge public event sand gathering.

II. PROPOSED SYSTEM:

So to come up with Precautionary measures for limiting the spread of virus we have made this Device. This venture intends to identify faces from pictures in Raspberry Pi. In face discovery, the calculation ought to be powerful and quick. In this model, the calculation utilized is proposed by Viola and Jones which has a very high identification rate, low false positive and negative rates and short computational time. Utilizing the proposed calculation, a face indicator is based on a Raspberry Pi Model B. After detection, we recognize the faces from the recognition algorithm. IN the recognition part we recognize the different faces which are captured from web cam. Once face is detected our secondary system will measure temperature using mlx90614 thermalscanner. This system will avoid the entry of person having high temperature hence to reduce spread of covid-19 virus.

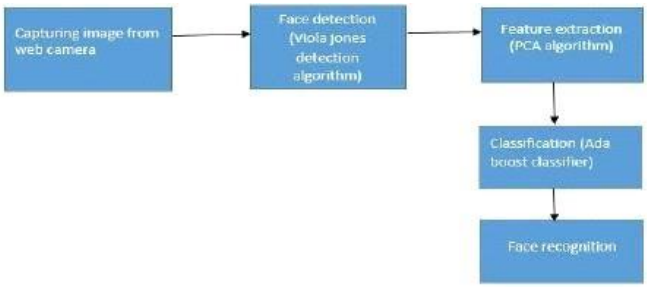
A. *Block Diagram*:



III WORKING PRINCIPLE:

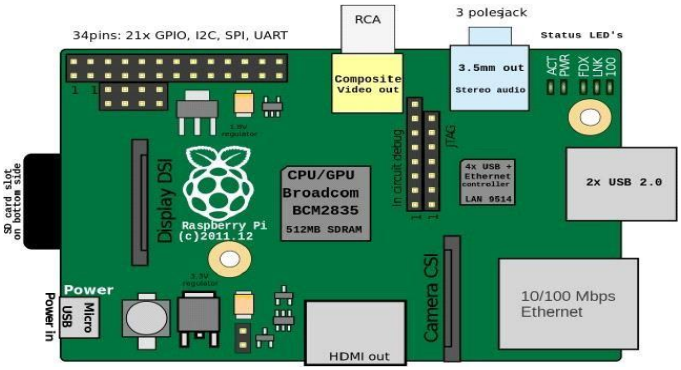
The device works by recognising the face of each person and doing thermal screening to detect the body temperature. If individual is found to have a very high temperature, then theses model will not allow entry and instead will automatically notify that person to take a COVID-19 test. If the body temperature falls between the required normal temperature range and is found to be okay, then entry isallowed after proper sanitization.

B. Real time Face Recognition Block Diagram:



IV HARDWARE REQUIRED:

A. Raspberry:



The Raspberry Pi 3 is the third time Raspberry Pi. It has a 1.2GHz 64-bit quad-focus ARMv8 CPU, 802.11n Wireless LAN, Bluetooth 4.1, Bluetooth Low Energy (BLE), 1GB RAM, 4 USB ports, 40 GPIO pins, Full HDMI port, Ethernet port, united 3.5mm sound jack and composite video, Camera interface, Display interface, Micro SD card opening, Video Core IV 3D outlines focus. It is endorsed for some generally valuable use andin many wander based utilization.

B. Camera Module V2:

Sony imx219 eight megapixel sensor. The advanced camera module might be utilized to take superior quality video, andstills pix. It's smooth to use for fledglings, however has masses to offer propelled clients in the event that you're hoping to grow your know-how. There are masses of cases online of individuals the utilization of it for time-slip by, steady development, and diverse video astuteness. You may moreover utilize the libraries we bundle manage the computerized camera to make comes about. The digital cam workswith all designs of raspberry pi 1, 2, and three. It canbe gotten to by means of the mmal and v4l APIs, and there are different 0.33-festival libraries workedfor it, alongside the pi camera python library

C. IR Temperature sensor MLX90614

The MLX90614 ESF is an Infra-Red thermometer for non-contact temperature measurements. Both theIR sensitive thermopile detector chip and the signal conditioning ASIC are integrated into the same TO- 2239 can. The Integrated MLX90614 GY-906 is also a low noise amplifier, 17-bit ADC, and powerful DSP
unit thus achieving high accuracy and resolution of the thermometer. The user can configure the digitaloutput to be PWM. As a standard, the 10-bit PWM is configured to continuously transmit the measuredtemperature in the range of -20 to 120 °C, with an output resolution of 0.14 °C.

D. HDMI Signal TFT LCD Display Panel, Mini TFT For HDMI Signal:

Winstar Released for Mini / Small HDMI Signal TFT LCD Display Panel: Winstar released for HDMI signal Displays are designed to work with theRaspberry Pi or embedded system, single board computers (or desktop/laptops) which support HDMI signal output. This series display modules come with a control board with a HDMI signal interface output; it is designed to make Raspberry Piusage become easily.

V ADVANTAGE:

1.Cost effective model: Cameras can measure the temperature of multiple people at once, especially beneficial in busy public areas .

2.Contactless measurement: effectively avoids cross-contamination

3.Reduced psychological impact: the non-interfering process provokes less fear and negative emotions

4.Data Stored can be accessed any time for future reference.

5.Can be used as an alternative for Biometric System of Attendance.

6.Will reduced Human Effect and lead to Automation

VI DISADVANTAGE:

1. Time consuming and labor intensive: can cause long queues when used in areas with a high volume of people, such as at high footfall areas, railway stations, airports and other public areas.

2. Chances of skipping this process and entering the premises.

VII FUTURE SCOPE

A Reliable and Application oriented approach will make this Device Compatible for general use. This Device will be step towards automation in corporate and other Sectors .Major Device for the safe environment from Covid-19.As Pandemic may likely to remain for long time this device will have a huge demand in market.

VIII RESULT

Fig: Actual device

Our point, which we believe we have come to, was to develop a methodology for face affirmation that is speedy, lively, and sensibly essential and correct with respectably fundamental and clear computations and procedures. This system aiming to help organizations respect the COVID-19safety rules and guide lines in order to reduce the disease spread .

IX CONCLUSION

This review will surely help for the research in same field which can further be studied and make can be converted into large scale application based device. These research and project is done by using embedded systems like Raspberry pi, MLX 90614 (IR temperature sensor), LCD display, etc.

This low cost, effective and reliable equipmentsused in our methodology can make a positive impact on today's covid-19 scenario.

X ACKNOWLEDGMENT

We express our sense of gratitude towards our project guide **Mr. Sachin Kahandal** for his valuable guidance at every step of study of this project, also his contribution for the solution of every problem at each stage. We also extend our sincere thanks to **Mr. P. R. Chaugule**, Head of the Department, Electrical Engineering and all the staff members who extended the preparatory steps of this project. We are very much thankful to respected Principal **Dr. M. S. Rohokale** for his constant support. Finally we want to thank to all of friends for their support & suggestions. Last but not the least we want to express thanks to our family for giving us support and confidence at each and every stage of this project.

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[20th -21st May, 2021]

In association with ISTE , IETE and CSI

Address for Correspondence SKN Sinhgad Institute of Technology and Science Lonavala, Pune. 410 401, MS, India.

Website: www.sinhgad.edu

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