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Automatic covid screening and deep learning

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Abstract-

The spread of COVID-19 has been taken on pandemic magnitude and has already spread over 200 countries in 2 years. In this time of emergency of COVID-19, especially when there is still a need to follow the developed vaccines are not available to all the developing countries in the first phase of vaccination distribution, the virus is spreading rapidly through direct or indirect contacts. The WHO provide the standard recommendations for preventing the spread of covid-19 and the importance of face masks for the protection from the Covid virus. That is why this research aims to design and develop a low-cost, rapid scalable and effective virus spread control and screening system to minimize minimize the chance and risk of spread of COVID-19. We proposed an IOT-based Smart Screening and Disinfection Walkthrough Gate(SSDWG) for all public place entrance.

The SSDWG is designed to do rapid screening of virus, including temperature measuring using a temperature sensor and storing the record of the suspected individual for further control of covid. Our proposed IoT-based Screening system also implemented Real-time deep learning model for face mask detection and classification. We also implemented classification to classify the type of face mask worn by the individuals, either N-95 or surgical masks. We also compared the results of our proposed system with state-of-the-art methods and We highly suggested that our system could be used to prevent the Spread of local transmission and reduce the chance of human carriers of COVID-19.

I. INTRODUCTION

The primary healthcare challenge in covid-19 is the infections virus that spreads rapidly among humans by their close contacts with suspects of COVID-19 positive. Covid-19 is now a pandemic affecting all countries around the world. Symptoms of covid-19 can appear from (2-14) days after exposure to the virus. Fever, dry cough, sore throat, headache, muscles or body aches, congestion or runny nose, nausea or vomiting and sleepiness are the most significant common signs of COVID-19. Still in several cases difficulty in breathing leads to death. Something a few infected individuals have minor or no symptoms; those are asymptomatic carriers. Asymptomatic. In short-range transmission the virus and spread from human to human by droplets from the noise or mouth while coughing and sneezing ban infected person of COVID-19. These droplets can travel 1.8meter.

These droplets stay on things and then poignant their eyes, nose, mouth. According to the primary source of COVID-19 Spread is closer contact from person-to-person. Asymptomatic people are more vulnerable than those people who have symptoms of COVID-19. But the chances of spreading this virus animal to people are low. They also have evidence of spreading the virus from people to pets, spray infected COVID-19 from people who have close contact with their pets, to disinfect the COVID-19, china uses drones to spray disinfecting the liquid around public areas and vehicles wandering in infected zones.

IoT applications are used in different systems and technical fields, such as smart cities, smart security system and smart grids. This model uses different IoT sensors, like heartbeat sensors to measure heartbeat rate to monitor the patients and store the data in a database, where these raw data have further analyzed the patient.

II. LITERATURE SURVEY:

Paper Name: Facial mask detection semantic segmentation.

Author Name: Toshanlal meenpal, Amit verma, Ashitosh bal, Akrishnan

Year: 2019

Summary: fuzzy we were able to generate accurate face mask for human objects from RGB channel image containing localizes objects. We demonstrate our results on human parsing database with mean pixels' level accuracy. The method can find applications in advance tasks such as facial part detection

Paper Name: Covid-19 facemask detection with deep learning and computer vision.

Author Name: Vinithe, Velantina.

Year: 2021

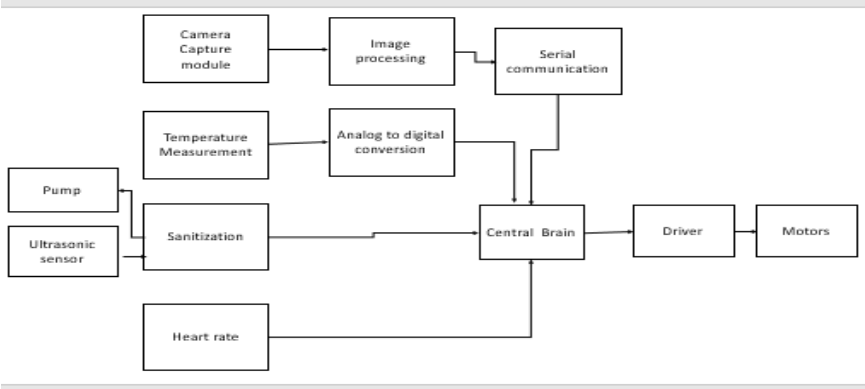
Summary: The development of face mask detection can detect if the person is wearing a face mask and allow their entry would be of great help to the society.

OBJECTIVES:

To design a system which will automatically perform the screening process for covid-19 without any human interference using image processing and sensors.

METHODOLOGY:

Fig: System architecture:



1) The image processing module:

Starting with the image processing module it is used to detect the mask on the face. It uses deep learning to do so. We have trained a module on mobile net using tensor flow and keras with a date set of around 1200 image out of which half are images with face mask and other half are images without mask. We have used the camera of laptop. After detecting if the mask is present or not the image processing will send the signal to the brain or the central processing using the serial communication.

2) The sensor module:

The sensor module consists of three sensors the ultrasonic sensor, temperature sensor and the heart rate sensor. All the input will be read using the central unit that is the node MCU. the ultrasonic sensor will be use detect the person when it come for the Screening process. The temperature sensor and heart beat sensor will be used to measure the body temperature and the heart beats respectively.

3) The output control module:

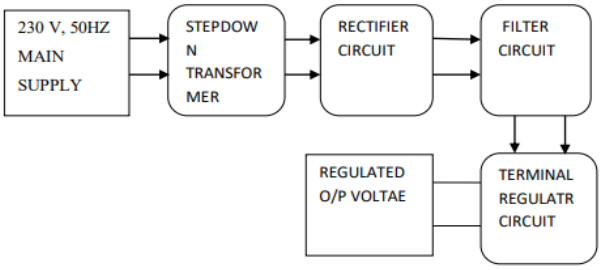
The output module will consist of 2 motor that are the water pump and the DC motor. The output module will also consist of an LCD that will be used to display. The water pump module will be used to spray the sanitize at the start. And DC motor that is operated on 12v and in 6rmo will be used for the door control.

The central processing unit is nothing but Node MCU. The Node MCU receives inputs from all the modules that are the image processing module and control the output. The Node MCU reads the values from all the sensors that are the temperature sensors, the heart beat and the ultrasonic sensor and control the pump motor and the Dc motor at the output.

The Node MCU receive the signal from the image processing module serially.

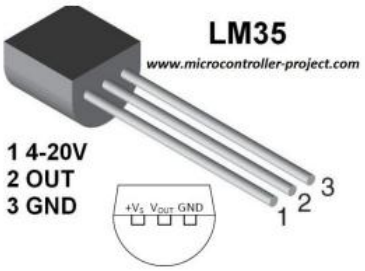
HARDWARE AND COMPONENT:

1. Power Supply:



Power supply is the first and most important part of our project. For our project we required 5V regulated power supply with maximum current rating pf 500mA.

2. LM 35 :



LM35 is precision integrated circuit temperature with an output voltage linearly proportional to the centigrade temperature.

Temperature is Calibrated directly in degree Celsius.

Operates from 4V to 30V of power supply.

3. Pulse Sensor:

The heartbeat rate can be complicated to calculate but to overcome this problem the pulse sensor or heartbeat sensor can be used.

Its diameter is 0.625.

Its thickness is 0.125.

The operating voltage range is 5V otherwise 3.3V.

This is plug and play type sensor.

4. Ultrasonic Sensor:

Ultrasonic module provides 2 cm to 400 cm non-contact measurement function. The range accuracy can be reach to 3mm of length. the module includes ultrasonic transmitters, receiver and control unit.

CONCLUSION:

- Using this system, we can reduce the Manpower.
- Using this system, we can Save the time.

FUTURE SCOPE:

- In future work, face masks have become a key tool in the global fight against covid-19. This system can be implemented in all social gathering places, offices, industry company, school/colleges.

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