

Mask Identification Entry Gate system using Arduino

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ABSTRACT

As we know the pandemic situation around us and many are doing various efforts to avoid it. Technological background and medical efforts are on the verge to prevent the situation. At least it's our duty as technocrats to provide the proper solution and the proposed system works on that principal. The main intension with the system is to make aware about for maintenance of hygienic conditions of an individual. The main objective is to make use of detection system and implementing on the basis of its condition. The mask was being an important part at the same time washing hand by making use of sanitizer. The system includes camera embedded with sanitizer machine and detect the user about its mask. Also this system installed at the gate which detects the image of the person entering into premises and if the mask was wearing by the person then only the gate will open and sanitizer will drop on the hand of person or else the system will not open the gate using Arduino.

Keywords: Techocrats, Sanitizer, Embedded, Gate, Arudino.

1. INTRODUCTION

Due to technical difficulties as well as their complexity in different fields, researchers do worked hard to find efficient algorithms which help to find solutions appropriate to reach speedy solution of the problems of covid. Specially using computer in the field of security, protection, the objects is recognition by using computer system becomes very necessary for making decisions. Nowadays, there is big scientific development not only in the information but also programming techniques, in which the images take important role in various zone such as medicine zone, media zone, education, design, industry, security and many others.

The main reason for the development is the wide using of computer network in all these above zones. The digital image permits to get images fastly without need for chemical treatments. The image processing is used in many computer vision advantage. It is notice that the most researches nowadays, especially image processing researches, tend to use in security field, because of the digital images become the main dependent component in most electronic devices which used in this field. Where it stores a group of images in a computer database and then using images processing programs it recognize the captured pictures from monitoring camera make the right decision depending on matching the recognized image with the stored computer database.

This system procedure start with a picture capture by the digital camera . The camera sends the captured picture to the computer system. The computer recognition program runs to recognize the picture and matching it with sorted computer database. In the case of the matching occurred, the system will permit to enter, by sending a signal , then the gate will open. Due to increasing need for protecting the materials and the articles in the houses, directorates, etc, this paper used a digital images, microcontroller to control opening as well as closing a building gate.

1.1 Objective

"Prevention is better than heal" is the effective measures to prevent the spreading of the COVID-19 and to protect peoples. Many doctors, reserchers working on vaccination for COVID-19. Corona spreads mostly by droplet infection .when the people cough or if they touch someone who is ill and then to our face (i.e.rubbing nose and eyes). Ongoing pandemic shows that it is spreads fast. Depending on the infection spreading, there are two cases: Fast as well as Slow spread. Fast pandemic will be terrible as well as will cost many lives. It is due to a fast rate of infection . This is because, if the numbers of infected people get too large, healthcare systems become unable to handle this. We will lack of resources such as medical staff or equipment such as ventilator. To avoid the this situation, we need to do turn this into a slow pandemic. A pandemic can be slowed down only by a right responses, mainly in the early phase. In this case, everyone who is sick can get treatment, there is no emergency point with flooded hospitals.

In this pandemic, we need to engineer our behaviour as a vaccine. that is, "Not getting infected" as well as "Not infecting others". The best thing for preventing we can do is to wash our hands with soap or a hand sanitizer. The next best thing is social distancing as well as need to wear mask.

To avoid getting infected or spreading Covid-19, It is essential to wear a face mask while going out from home especially to public places such as markets or hospitals and other.

2. WORKING PRINCIPAL

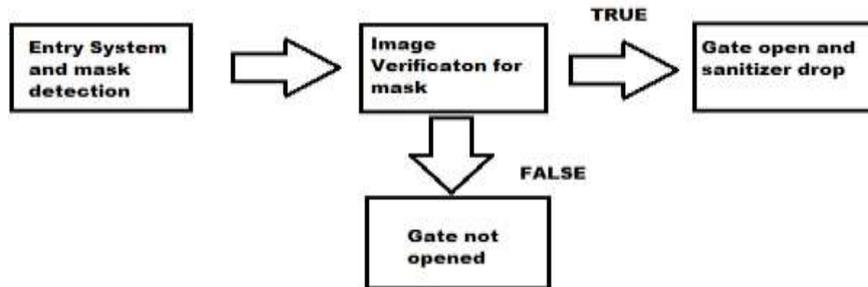


Fig 1. Block Diagram of Proposed Project

Proposed System:

The main intension with system is to make aware about for maintenance of hygienic conditions of an individual. The main objective is to make use of detection system and implementing on the basis of its condition. The mask was being an important part at a same time washing hand, by making use of sanitizer. The system put in camera embedded with sanitizer machine and detect the user about its mask. Also this system installed at the gate which detects the image of the person entering into a premises and if the mask was wearing by the person then only the gate will open and sanitizer will drop on the hand of person or else the system will be not open the gate. After the arise of Covid-19, the Face-Mask of detection has widely considered problem in the image processing field. This technology is currently additional appropriate because it is applied to a detect faces and to identify people wearing a masks in images, videos and also in real-time vision. By using deep learning and convolution of neural network (CNN) techniques, it become possible to achieve high accuracy due to results in image classification and object detection applications.

Flow of the program:

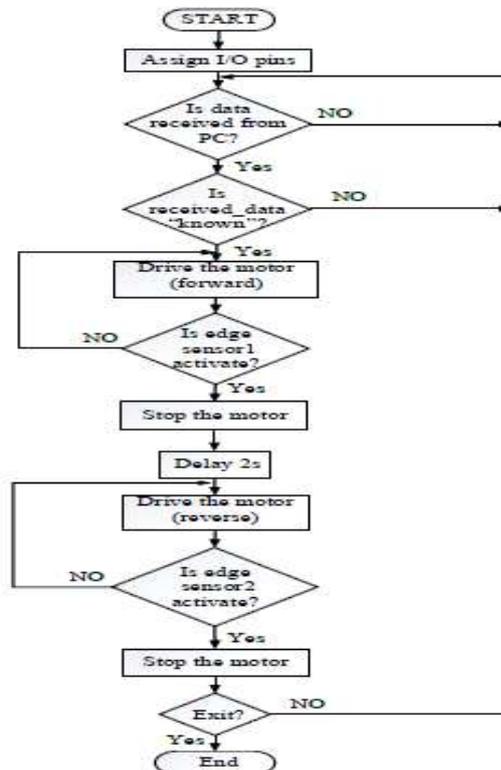


Fig.2 Flow of the program

2. LITERATURE SURVEY

Face recognition is a method which identifying person face the identity of an individual using their face. There are different algorithms that can do face recognition, but their accuracy might vary. Here I am going to describe, how we do face recognition using deep learning. So now let us understand how we recognise faces using a deep learning. We make a use of face embedding in which each and every face is converted into a vector and this technique is called as deep metric learning, Let further divide this process into three simple steps for easy to understanding.

Feature Extraction: Now that we have cropped a face out of the image, we extract the features from it. Here we are going to use of face embeddings to extract the features out of the face. A neural network takes an image of the person's face as an input and outputs a vector which represents the most important features of a face. In machine learning, this vector is also called as embedding and therefore we call this vector as a face embedding. Now how does this help in recognizing faces of different persons?

$$f \left(\text{Image of a man's face} \right) = \begin{pmatrix} 0.112 \\ 0.067 \\ 0.091 \\ 0.129 \\ 0.002 \\ 0.012 \\ 0.175 \\ \vdots \\ 0.023 \end{pmatrix}$$

Fig. 3 Feature Extraction

2.1 Arduino Nano

• Basic Features of Arduino Nano

Here are few of its basic features which you must know if you are thinking to work on this great microcontroller board:

- It has 22 i/o pins in total.
- 14 of these pins are digital pins.
- Arduino Nano has 8 analogue pins.
- It has 6 PWM pins among the digital pins.
- It has a crystal oscillator of 16MHz.
- Its operating voltage is different from 5V to 12V.
- It also supports different ways of communication, which are:
 - Serial Protocol.
 - I2C Protocol.
 - SPI Protocol.
- It also has a mini USB Pin which is used to upload code.
- It also has a Reset button on it.

3. ADVANTAGES:

- It is helpful for long-term monitoring purposes.
- Frequent diagnosis is possible.
- Due to the use of different sensors, the accuracy of the parameters is maintained.
- Helps to reduce human errors.
- Easy to monitor at any interval of a specified time interval.

4. DISADVANTAGES:

- Equipment and installation costs.
- System crashes due to damage in interconnection.
- Reliability.

5. APPLICATION:

- Bank
- Hotels
- Hospitals
- High Security Zone Area

6. FUTURE SCOPE:

• Interoperability:-

Different hospital today use different standards to support their applications. With numerous sources of a data and heterogeneous devices, the use of standard interfaces between these diverse entities becomes important. This is especially so for a applications that supports cross organizational and different system boundaries. For example, in the Logistics sector, the supply chains involve multiple stakeholders like retailers, manufacturers, logistics, the arduino based systems need to handle high degree of interoperability in order for information to be processed down the value chain and may provide the accuracy using IoT based technology.

7. CONCLUSION:

As we know the pandemic situation around us and many are doing various efforts to avoid it. Technological background and medical efforts are on the verge to prevent the situation. At least it's our duty as technocrats to provide the proper solution and the proposed system works on that principal. The main intension with the system is to make aware about for maintenance of hygienic conditions of an individual. The main objective is to make use of detection system and implementing on the basis of its condition. The mask was being an important part at the same time washing hand by making use of sanitizer. The system includes camera embedded with sanitizer machine and detect the user about its mask.

from the experimental result table, is seems that the real time face-detection system has a high accuracy in detecting mask, this help to control the spreading of COVID-19 in public places by preventing the people to enter it without wearing a face mask.

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