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Automated Evaluation of covid-19 Risk Factors using CNN

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Abstract: *During the COVID-19 pandemic, you are required to wear a mask in public places, since properly wearing one provides maximum protection from viral transmission. A person's body temperature can also play a significant role in this pandemic. In this project, we are seeking to meet the current demand for deep learning, and design a real-time, real-time algorithm for early detection Before entering a public space, a person should wear a mask and be aware of the temperature of their head. Here, we make use of a Utilizing an Arduino and temperature sensor to create an object detection method using deep learning to detect mask position and head temperature. Input images are generated by RGB cameras and the body's temperature is measured with temperature sensors. This experiment yields a live video that shows an individual's mask is being worn properly and his or her head temperature can be assessed.*
Keywords *- Covid-19, Pandemic, Mask, Temperature, Sensors, Detection*

I. Introduction

Toward the end of 2019, earlier this year, the world witnessed a disturbing scenario that only very few of us could have predicted would have such a significant impact throughout the world. Local outbreaks in Wuhan, China, quickly grew into a global pandemic as local governments took slow precautionary measures and underestimatedthe threat posed by COVID-19. Fortunately, in the subsequent years, preventive measures, both globally and across the globe, have been taken toslow down the already destructive social and economic effects. As a means of combating the pandemic and preventing Instruments from further spreading, either treatment or research-related, Virus detection and monitoring technology, such as ventilators, has become essential for the prevention of the spread of disease. It is still relatively costly and time-consuming to run a test using reverse transcription-polymerase chain reactionsor antibodies, An evaluation of the body the temperature could be performed at different checkpoints using medical-grade infrared sensors and appropriate hygiene requirements, Providing individualized, indoor location data could provide a quick and effective means for controlling the spread of disease in enclosed environments, such as offices or factories.

II. Obejectives

The COVID-19 virus is prevented from spreading by implementing prevention measures.

This study suggests that wearing a mask can potentially decrease the viral reproduction number in a general population. Wearing a mask in combination with social distancing and other measures is promising to replace the shelter-in-place orders and significantly reduce the COVID-19 burden on society

Awareness of wearing mask.

Wear Face Coverings in Common Spaces Face coverings must be worn in all common spaces (classrooms, buildings, hallways, lounges, restrooms, dining areas, student activities areas, and the like) when you are around others. This includes outdoors when it is not possible to socially distance and in congregant settings.

Following the protocol of "NO MASK NO ENTRY".

No entry without face mask sign you can let visitors and customers know that they are requiredto wear a face mask before entering the facility. This way they can effectively protect themselves and the people surrounding them.

Automatic evaluation of bodily temperature.

If someone has COVID-19, a pulse oximeter may help them keep watch over their health and know if they need to seek medical care. However, the oxygen level measured by a pulse oximeter is notthe only way to know how sick someone is. Some people may be very sick and have good oxygen levels, and some may feel OK, but have surprisingly poor oxygen levels.

Sensing the Oxygen Level of Person Like Oximeter by Scanning the Fingerprint

Pulse oximetry results may not be as accurate for people with darker skin. Their oxygen levels are sometimes registered by the pulse oximeter as higher (or better) than they really are. People who use pulse oximeters at home should keep this in mind when looking at results. Knowing what their normal baseline pulse oximeter reading and noticing a drop in their reading, even if still in the normal range, may be significant for someone with darker skin.

Automatic Sanitizer disposal system after all the criteria passed.

An automatic hand sanitizer dispensing machine is an automated, noncontact, alcohol-based hand sanitizer dispenser, which finds its use in hospitals, workplaces, offices, schools, and much more. Alcohol is basically a solvent, and also a very good disinfectant when compared to liquid soap or solid soap, also it does not need water to wash off since it is volatile and vaporizes instantly after application to hands.

Deep neural networks can be effectively utilized by utilizing the OpenCV module.

OpenCV's Deep Neural Network (DNNs)is a module that can be used to train and test deep learning models. There is a framework that is used to train the model that is Caffe. We can even train the DNNs using just our CPUs or GPUs. Using just a CPU gives a pretty decent performance.

III. Literature Survey

Face Mask and Body Temperature Detection System to Prevent COVID for Work Environment

Authors: Megha Warungase, Ruchita Wagh, Komal Jundre, Prof. S.G. Chordiya Published Year: 2021
Methodology: The more accurate face detection algorithm RETINAFACE is used as the basic algorithm for mask face detection, and on this basis, the network structureOf the RETINAFACE algorithm is improved, the current popular ones For the face recognition method, we use the DEEPFACE algorithm. The algorithm divides the face recognition Problem into several related sub problems.

Future Work: Fine-tuned mobilenetv2 on our mask/no mask dataset and Obtained a classifier that is ~99% accurate.

Detection of Face Mask using Convolutional Neural Network

Authors: Riya Chiragkumar Shah, Rutva Jignesh Shah Published Year: 2020
Methodology: The model proposed here is designed and modeled using Python libraries namely Tensorflow, Keras and opencv. The Model we used is the mobilenetv2 of on volurional neural Network. The method of using mobilenetv2 is called using Transfer Learning. Tune the model with the hyper parameters : Learning rate,number of epochs and batch size
Future Work: Great accuracy for single Face with and without mask. For multiple faces also it gives Quite good accuracy. It works easily on any mobile device just By switching on the video stream

Face Mask Detection using Convolutional Neural Network (CNN) to reduce the spread of Covid-19

Authors: F.M. Javed Mehedi Shamrat Sovon Chakraborty Md. Masum Billah Md. Al Jubair Md Saidul Islam Rumesh Ranjan
Published Year: 2021

Methodology: CNN are a kind of deep neural network which is typically used in deep learning to examine visual imagery. A CNN is a Deep Learning algorithm that would take an image as input, assign meaning to different parts of the image, and differentiate between them. Because of their high precision, CNNs are used forimage

Future Work: The training and validation accuracy after using the Deep CNN [31] model with Max Pooling toreduce the dimension of our image feature map.
The Face Mask Detection For Preventing the Spread of COVID-19

Authors: Susanto Febri Alwan Putra Riska Analia Ika Karlina Laila Nur Suciningtyas Published Year: 2020
Methodology: As for the face mask detector method, this work implemented the deep neural network known as

YOLO V4. According to [11], the YOLO V4 is able to run twice faster than the other deep neural network method which is used to detect the object. The performance of this version is able to improve the YOLOv3' AP by 10% and FPS by around 12%.
Future Work: This work developed the face mask detection by using YOLO V4 algorithm. The YOLO V4algorithm consists of deep learning method which is able to detect the object properly

Automatic Measurement of Human Body Temperature on Thermal Image Using Knowledge-Based Criteria

Authors: Hurriyatul Fitriyah , Aditya Rachmadi , Gembong Edhi Setyawan Published Year:2017
Methodology: It search inner-canthus in each eye individu-ally to result more adaptive localization. The facemust not wearing glasses since the inner-canthus would be covered and infrared could not transmit through glass. Images were acquired using thermal infrared camera with locked range of temperature of 26 C - 37 C. Face detection algorithm for infrared images
Future Work: Able to locate inner-canthus in individual eyes with good accuracy. Further study should investigate additional discriminant features of eyes or inner-canthus to increase the local-ization accuracy

Design of a contactless body temperature measurement system using Arduino

Authors: Asif A. Rahimoon, Mohd Noor Abdullah, Ishkrizat Taib

Published Year: 2020

Methodology: Comprised of an Arduino controller, LM-35 (S1), MLX-90614 (S2) temperature sensors and ESP-wifi shield module. The obtained result has shown that real time temperature monitoring data can be transferred to authentic observer by utilizing internet of things (iot) applications
Future Work: The collection of real time data is controlled by CT-UNO controller. The transferring of sensed data from implemented LM-35 and MLX-90614 temperature sensors at the online portal is performed through ESP-wifi shield

IV. Methodology

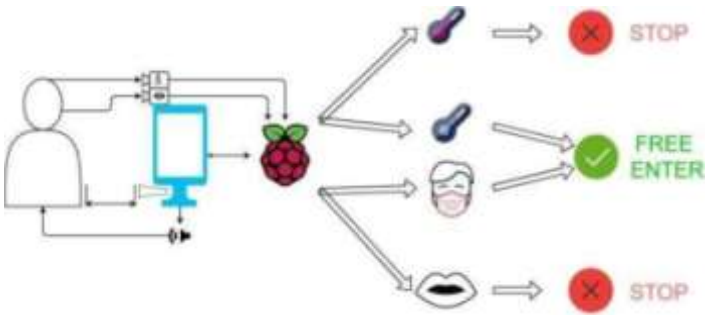


Fig 1. System design.

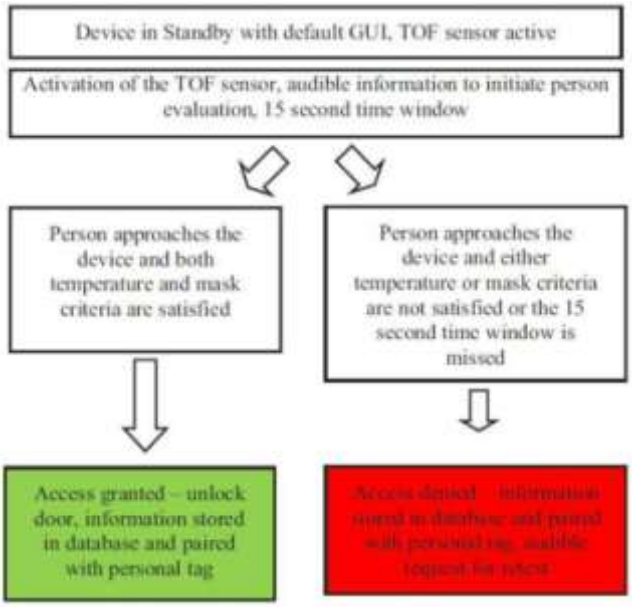
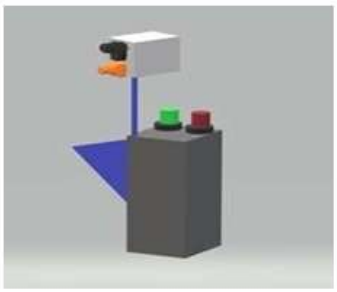


Fig 2. Presence detection workflow in standard operation m

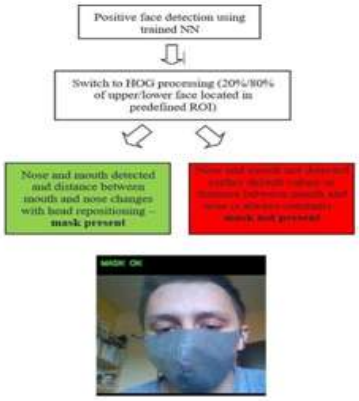
V. Experimental Setup

The COVID-19 pandemic has brought a lot of difficulties to the nation, and the virus's spread must be controlled since the virus has impacted over crores of people across the world. So, the development of a face mask detection system with audio response can determine, if someone is wearing the mask or not wearing the mask and gives the audio response according to it can benefit in many cases. So, we have provided a deep learning model by using frameworks TensorFlow and Keras including MobileNetV2 and OpenCV.

The Contactless Sanitization and Temperature Monitoring System can monitor the temperature and display on OLED, allows for sanitisation and gives the audio response according to it. Therefore, through this system, we hope to protect people from virus transmission and the spread of infectious diseases. We plan to implement it further by, integrating the two sections that are Face mask detection and Contactless Sanitization and Temperature Monitoring System make it a single product with low cost.



VI. Results and Analysis



Detected facemask and temperature <37.0 - 38.0 **°C** Processed Image while mask ON

VII. Conclusion

In this Project, we are integrating a face mask detection system to detect and capture the temperature of a specific point inside a predicted bounding box. Developed a COVID-19 face mask detector using OpenCV, Python, and Deep Learning. To create our face mask detector, we trained a two-class model of people wearing masks and people not wearing masks.

The proposed device above can help in two ways – via automatic evaluation of bodily temperature at various checkpoints and by enforcing proper hygiene standards related to face masks.

References

[1]. MobileNets: Efficient Convolutional Neural Networks for Mobile Vision Applications - Andrew G. Howard Menglong Zhu Bo Chen Dmitry Kalenichenko Weijun Wang Tobias Weyand Marco Andreetto Hartwig Adam
[2]. Deep Learning for Automated Recognition of Covid-19 from Chest Xray Images - Linh T. Duong, Phuong T. Nguyen,_, Ludovico Iovino,Michele Flammini
[3]. Real-Time Face Mask Detection and Thermal Screening with Audio Response for COVID-19. - M. Sivasankara Rao1; K. Tejasree; P. Sathwik; P. Sandeep Kumar; M. Sailohith
[4]. Study on Convolutional Neural Network to DetectCOVID-19 from Chest X-Rays - Azher Uddin, Bayazid Talukder, Mohammad Monirujjaman Khan , and Atef Zaguia
[5]. Real-Time Implementation of AI-Based Face Mask Detection and Social Distancing Measuring System for COVID-19 Prevention Safa Teboulbi , Seifeddine Messaoud , Mohamed Ali Hajjaji and Abdellatif Mtibaa
[6]. Automated evaluation of COVID-19 risk factors coupled with real-time, indoor, personal localization data for potential disease identification, prevention, and smart quarantining J. Barabas,R. Zalman and M. Kochlan
[7]. Design of a contactless body temperature measurement system using Arduino Asif A. Rahimoon1, Mohd Noor Abdullah2, Ishkrizat Taib3
[8]. Detection of body temperature with infrared thermography: accuracy in the detection of fever - Ming Yui Cheung, Lung S Chan, Cyrus Rustam Kumana
[9]. Body Temperature Detection and Data Collection during COVID-19 - Wenhong Yu, Chenlu Luo and Kaun Wang
[10]. Face Mask Detection using Convolutional Neural Network (CNN) to reduce the spread of Covid-19. - F.M. Javed Mehedi Shamrat, Sovon Chakraborty, Md. Masum Billah, Md Al Jubair
[11]. Combining a convolutional neural network with autoencoders to predict the survival chance of COVID‑19 patients - Fahime Khozeimeh,Danial Sharifrazi, Navid Hoseini Izadi, Javad Hassannataj Joloudari, Afshin Shoeibi, Roohallah Alizadehsani,
[12]. Noncontact Body Temperature Measurement: Uncertainty Evaluation and Screening Decision Rule to Prevent the Spread of COVID-19 -Giovanni Battista Dell'Isola, Elena Cosentini , Laura Canale , Giorgio Ficco and Marco Dell'Isola
[13]. Role of Artificial Intelligence in COVID-19 Detection Anjan Gudigar 1, U Raghavendra 1,*, Sneha Nayak 1, Chui Ping Ooi 2, Wai Yee Chan
[14]. FACE MASK DETECTION USING MACHINE LEARNING Mr.Kalla.Kiran1, Bokka Vamsi Kiran 2, Devarapalli Cheswanth Sai 3 , Gaggala Vijay Vamsi 4 Pitta Rani Salomi
[15]. A Deep Learning Model for Face Mask Detection- Abd El-Aziz Ahmed, Mahmood A. Mahmood
[16]. Automatic Measurement of Human Body Temperature on Thermal Image Using Knowledge-Based Criteria - Aditya Rachmadi, Gembong Edhi Setyawan
[17]. Detection of Face Mask using Convolutional Neural Network – Riya Chiragkumar Shah, Rutva Jignesh Shah
[18]. Recent Advances in Convolutional Neural Networks Jiuxiang Gua,_, Zhenhua Wangb,_, Jason Kuenb,
[19]. The sanitation and hygiene targets of the sustainable development goals: scope and challenges Duncan Mara and Barbara Eva