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Iot-Based System for Mask Detection and Temperature Sensing

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Abstract— The spread of COVID-19 has been taken on pandemic magnitudes and has already spread over 200 countries in a few months. In this time of emergency of COVID-19, especially when there is still a need to follow the precautions and developed vaccines are not available to all the developing countries in the first phase of vaccine distribution, the virus is spreading rapidly through direct and indirect contacts.based screening system also implemented real-time deep learning models for face mask detection and classification Contactless temperature sensing subsystem relies on Arduino Uno using Temperature sensor or thermal camera, while mask detection and social distancing check are performed by leveraging computer vision techniques. "In this paper, it is suggested that the system could be used to prevent the spread of local transmission and reduce the chances of human carriers of COVID-19".

Keywords— Raspberry pi, Raspberry pi camera, os, 15.3wUSB-C, Tensorflow.

I. INTRODUCTION

Since the last days of the previous year, the occurrence of novel infectious flu-alike respiratory disease COVID-19 caused by SARS-Cov-2 virus (also known as coronavirus) has affected almost every aspect of people's lives globally. First, it was discovered in China, but spread quickly to other continents in just few weeks. According to, until July 11th, 2020, the total number of identified cases Common symptoms of coronavirus disease include fever, tiredness, sore throat, nasal congestion, Therefore, the usage of face masks and sanitizers has shown positive results when it comes to disease spread reduction. However, the crucial problem is the lack of approved vaccine and medication due to these facts, 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, movement within country boarders and abroad, often together with prohibition and cancellation of huge public events and gatherings. Despite the fact that the pandemic seemed weaker at some points, most of safety regulations are still applied due to unstable situation. From workplace behavior to Social relations, sport & entertainment coronavirus disease.

A. Objective

Face mask detection refers to detect whether a person is wearing a mask or not. In fact, the problem is reverse engineering of face detection where the face is detected using different machine learning algorithms for the purpose of security, authentication and surveillance.

B. Design of IOT-BASED SYSTEM FOR MASK DETECTION AND TEMPERATURE SENSING

This project aims at iot-based system for mask detection and temperature sensing, n Raspberry Pi can be done using the mask detector model. In this work, a Raspberry Pi 3 Model V is used. It is a lowcost, compact gadget that plugs into a computer. The Raspberry Pi is connected to the laptop via a LAN cable. The VCC of the first IR sensor has a connection with the 2nd pin on R pi, the GND pin has a connection with the 34th pin of the R pi, and the output is connected to the 40th pin of the R pi, which is a general-purpose I/O pin commonly known as GPIO pin. VCC of the second IR sensor has a connection with the 17th pin, GND to the 13th pin, and out pin to the R pi's 38th GPIO pin. The servo motor's VCC has a connection with 5V input which is the 2nd pin, next GND pin is connected to pin number 39 and the signal pin to pin number 37 which is the GPIO pin on R pi's. The MLX90614 temperature sensor's VCC pin has a connection with 1st pin on R pi, its GND has a connection to pin number 16 on R pi, and the HCL and HDL pins of the sensor are connected to the 2nd and the 3rd pins of the R pi. The R pi camera is attached to the R pi's camera module port.

In addition to the above, the system can be

enhanced with attachment of GSM modem so that user can receive emergency messages. The user can receive the data anywhere by using mobile phone.

C. Components Required

Hardware Components:

- Raspberry pi
- Raspberry pi camera
- Temperature sensor
- Raspberry Pi 15.3W USB-C Power Supply
- IR sensor
- Female/Male Extension Jumper Wires

Software Components:

- Raspberry Pi OS
- Tensor Flow
- Open CV

A. System Architecture

The fundamental advantage of CNN over its predecessors would be that it automatically detects significant features without the need for human interference. As a result, CNN would be an excellent answer to computer vision and picture categorization challenges. To utilize another approach, first features from images should be created and then feed those features into a classification technique such as SVM, KNN, logistic regression, and so on. When compared to CNN, these algorithms learn less.

System Overview

The training was carried out on a computer running the 62-bit Windows10 operating system and equipped with an Intel ® CoreTM i5- 8265U CPU running at 1.60GHz and 8 GB of RAM. Python 3.7 is being used as the application development language. The model was developed and trained using Keras as the backend and the Tensor-flow platform. To generate mask detector model input dataset and fine-tune MobileNetV2 is accepted using the training python script. A training history plot.png with accuracy/loss curves is also generated, as seen in.

D. DEMONSTRATION OF PROTOTYPE

Prototype Face mask detection refers to detect whether a person is wearing a mask or not. In fact, the problem is reverse engineering of face detection where the face is detected using different machine learning algorithms for the purpose of security, authentication and surveillance. Detect body temperature of the person.

E. Problems Encountered

- The problems encountered with this approach include high complexity in feature design and low detection accuracy.
- In recent years, face detection methods based on deep convolutional neural networks (CNN) have been widely developed to improve detection performance.

F. Solutions

1. In this paper, a deep learning algorithm is used to identify face mask recognition and, Convolution Neural Networks (CNN) classification.
2. A CNN is a form of artificial neural network that is specifically built to interpret pixel input and is mainly used for image recognition and analysis, in which each layer applies to a different set of filters.
3. Around 100's to 1000's of filters is combined to give a final result and then the obtained output is sent to the next layer in this neural network.
- Evaluation of the proposed framework is done by the face mask detection algorithm using the TensorFlow.

4. The Mask detector model is trained by using Keras and TensorFlow. The steps involved in the algorithm is given below

STEP1:DATASETCOLLECTION STEP2:PRE-PROCESSING STEP3:SPLITTING
STEP4:TRAINING
STEP5:TESTING/EVALUATION

Finally, the dataset should be evaluated and compared with the ground-truth labels because adding visual, audio, video or other highvolume data may not affect your local network.

G. Advantages

- It has fast and high accuracy
- This system can be implemented in ATMs, Banks etc
- We can keep peoples safe from our technique.
- It provides buzzer sound to wear mask.

H. Limitations

- The trained model was able to achieve a result of 97 percent. The test results demonstrate a high level of accuracy in detecting people wearing and not wearing facemasks.
- However, its main advantage over IR sensor is the ability to measure the temperature of several persons at once, but requires additional data processing.

I. Expected Outcome

- Identify person's face.
- To create a model in tensor flow to detect weather a person is wearing a face mask or not.
- Using temperature sensor, measure the

person's body temperature.
Check weather an individual is wearing a mask and his body temperature is normal.

REFERENCES

[1]. M Sivasankara Roa,Real "Time Face Mask Detection and Thermal Screening with Audio Response for COVID-19",2021,ISSN:2237-0722, pp.1029-1038, 2019.

[2]. Sammy V. Militante, Nanette V. Dionisio, ''Deep Learning Implementation of Facemask and Physical Distancing Detection with Alarm Systems", 2020 Third International Conference on vocational Education and electrical Engineering Doi:10.1109/ICVEE50212.2020.9243183

[3]. R. Sujatha, Jyotir Chatterjee and Aboul ella Hassanien, "A machine learning methodology for forecasting of the COVID-19 cases in India," Apr 18, 2020. https://www.techrxiv.org/articles/preprint/A_machine_learning_ methodology_for_forecasting_of_the_COVID 19_cases_in_India/12143685/1.

[4]. vinod bg, teja's a, "Implementation of automatic contactless temperature sensing and door access", international journal of advanced research in computer and communication engineering, vol. 9, issue 6, june 2020

[5]. Abhinandan Sarkar, Faculty of Electronics Department of Computer Science and Technology Luthfaa Polytechnic Institute, Durgapur (W.B), Design of Automatic. Hand Sanitizer with Temperature Sensing, International Journal of Innovative Science and Research Technology.