Software Development for AI

Project-1 Group Proposal

Proposed Title: Face Recognition Based Attendance System with Face Mask.

Team members:

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Workflow:

The suggested training model for the face mask detection predictive modeling. The data set for the face mask is loaded into the training script as the initial step. The data is provided to the classifier model after preprocessing. TensorFlow/Keras-based MobileNet V2 is used for training; this classifier is still superior to Convolutional neural networks because the training process is relatively quicker while the accuracy only slightly improves. The training phase is saved to the disk after it is finished. By utilizing the matplotlib package to plot a graph, the training process is observed.

- Discussion of the idea and gathering the information
- Creating an environment, software, tools required and developing of the architecture and dividing the roles.
- Getting the required datasets from various sources, making the improvements, setting up the infrastructure and working towards the project goal
- Finally, testing a real time implementation from the user side.

Project Design and Milestones:

Step 1: Import required libraries and import dataset.

Step 2: Data Pre-processing to convert images to gray scale and separate labelled images

Step 3: Build network using Sequential API of Keras.

Step 4: Train the Face Mask Detection Classifier.

Step 5: Feature Alignment and Extraction.

Step 6: Building and training the Face recognition module.

Step 7: Trigger an email to the concerned authority alerting them if the person is not wearing a mask and generate a report with the person's name and timestamp.

Block Diagram for the Proposed System:
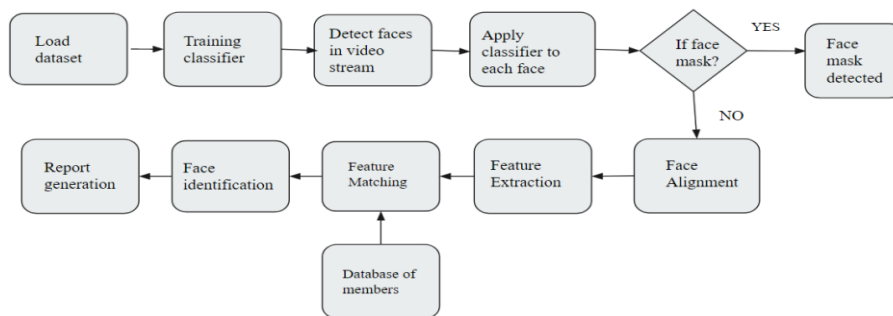
Weekly Meetings:

We will get together every Friday 5pm to 8pm.

And we will connect via zoom meetings if any case encounters and physically at Library.

Abstract:

The best defense against coronavirus is a face mask, thus as time goes on, medical professionals are encouraging everyone to use one. As a result, a variety of identification techniques are available to tell people wearing Face Masks apart. Masks are suggested as a simple blocker to prevent the respiratory beads from spreading into the air around the sufferer and onto others when they sneeze or talk. The idea is based on the existing understanding of how respiratory beads work, which helps explain how the disease spreads.

Our assignment is more of a real-world application where deep learning is used to determine whether a person is wearing a mask or not. If a person is found without a mask, a notification will be sent to them through email if their email address is stored in the platform's database. Along with this, a report containing the person's information and the times when they were not wearing masks will also be generated. The face of the person is also recognized using the face detection model incorporated within the mask detection model, and our classification system is MobileNet V2 neural networks.

Programming Language Used: Python (IDLE-python 3.9.5)

Tools/Modules: OpenCV, numpy, argparse, pickle,keras, smtplib, SMTP

AWS: EC2 for compute, S3 for Storage, IAM for Access Management, RDS for Database

Resources/ References:

D. Chiang, Detect faces and determine whether people are wearing mask, 2020, https://github.com/AIZOOTech/Facemask Detection.

https://www.mygreatlearning.com/blog/real-time-face-detection/

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8223067/

Related projects:

Real-time face detection by Marcelo Rovaoi, a computer vision technology.

GitHub Link for the Project:

https://github.com/SaiManideepReddy/SDAI-Project-1/blob/main/SDAI_P1_Proposal.pdf