SHIV NADAR UNIVERSITY

KALAVAKKAM-603110

MINI PROJECT - 2022

Face Visualization System

Team Members: S Shruti, Shravya D, Shree Niranjana M, Trishaa S

Second Year, CSE Department

Project Guide: Dr. S Manisha

Assistant Professor, CSE Department

Project Duration: 3 months

Signature of the Project Students

Signature of the Project Guide(s)

1. Project Title: Face Visualization System

2. Broad Subject: Image Processing and Computer Vision

3. Project Duration: 3 Months

4. Project Summary:

Wearing a face mask has become an indispensable part of our lives, ever since the coronavirus came into existence. During the pandemic, masks played a critical role in preventing transmission of the virus and hence were very widely used. However, because the concept of wearing masks on such a regular basis was completely new to the masses, it has been difficult to implement the practice effectively. Face masks are often not worn properly, rendering them useless and hence it becomes imperative that there is some mechanism to check the same, preferably without human intervention as there is already shortage of personnel in several areas. In such a situation, an automated Face Mask Detection System comes in vary handy. This is the first vital component of the Face Visualization System.

There are two other facets to this project which are intended to be implemented at a later stage. These include Facial Identity Recognition and Emotion Recognition Systems which have their own respective utilities. A brief description of the aforementioned aspects are as follows:

Nowadays, facial identification software is extensively used for various purposes. Be it attendance management, investigation of criminal activities or, biometric systems, sensitive access-control environments or security related reasons, face recognition has been instrumental in enforcing important technicalities in several such settings. Because of the fact that image processing has become so advanced today, a lot of things have been simplified to a greater extent and integrated in more efficient manner for the smooth functioning of different departments.

In addition to this, emotion recognition via facial expressions is the third and most complex feature of this project. Identification of the basic universal emotions with the help of AI can aid a myriad of organizations worldwide. Whether it is for testing consumer satisfaction and improving product sales in business ventures via influential marketing and advertising, general surveillance or, monitoring of finer details in constrained environments like a job interview, military training or criminal inquiry, micro expressions give away a lot of hints about an individual, thus raising the utility value of this sector of the system as well.

The combined impact of all the characteristics of the project if implemented successfully, can prove to be extremely beneficial in saving time, resources and manual effort per se. Especially in the case of face and emotion recognition, this system can help ascertain justification for some occurrences and deduce a nearly logical conclusion, of course not at par with the human intelligence and expertise but rather in a more indirect manner.

5. Keywords:

Image capture, image processing, datasets, model training, face detection, facial recognition, Viola Jones Algorithm, Local Binary History Pattern, neural network, machine learning, deep learning, pre-processing, feature extraction, post-processing stages.

6. Software Requirements:

Python 3, Python Libraries (numpy, pandas, os, matplotlib), dlib and face_recognition, OpenCV, Keras, Kaggle, cloud storage for datasets, Python IDE like Spyder or Jupyter Notebook, Tensorflow.

7. Stakeholders:

Project Guide – Dr. S Manisha
Team members – S Shruti, Shravya D, Shree Niranjana M, Trishaa S
Users – General public
Investors – Educational institutions, mall owners, government (depending upon their respective needs)

8. Objectives:

- To arrange for image datasets for model training and allocate proper cloud storage
- To prune, filter and prepare the datasets for further analysis
- To import all necessary libraries essential for the completion of the goal
- To formulate the code and implement appropriate algorithms for the same
- To estimate the model performance with new unseen test data
- To review the overall project and incorporate further improvisations

9. Unique Selling Point:

This project is different from other existing ones because of the fact that it combines three major specialities and interlinks them to derive additional useful information, which hasn't been introduced earlier. Apart from this we also support the possibility of customisation of our project features as per the need of the client, such as enabling only mask detection in malls, mask detection and face recognition for an attendance management system, or perhaps facial recognition and emotion detection for criminal investigations, or employing only emotion detection during interviews to gauge the perception of the interviewees and improve the interview structure in future etc, thereby implementing a bespoke software functionality.