Computer Engineering Department

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UNIVERSITY OF MUMBAI

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A Project Report on

Human age, gender and emotion recognition

Submitted in partial fulfillment of the degree of
Bachelor of Engineering(Sem-7)
in
Computer Engineering

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1.Project Conception and Initiation

1.1 Abstract

- Emotions play a very significant role in conveying what we think.
- Research has shown that almost 90% of our communication can be non-verbal.
- The overall body language coupled with emotions could help to effectively recognize the thought process. Hence recognizing emotions becomes a vital task.
- There a seven types of emotions namely, happy, sad, anger, smile, neutral, disgust and fear. To effectively identify these would help to decipher the thinking. Hence the importance and need of recognizing emotions is growing rapidly.

1.2 Objectives

- To be able to recognize human emotions, age, gender effectively.
- To be able to distinguish between the different characteristics.
- To focus on optimizing the resources.

1.3 Literature Review

- Image are the most direct and most natural channels that people acquire information. If achievements in these two fields are applied on robots that can great improve the intelligence of the machine.
- In practice, in image recognition we will encounter the feature selection problem. Common image features are composed of color feature, texture feature, shape feature, spatial relations characteristics. Sometimes in order to acquire a better final result, these characteristics also be integrated appropriately.
- CNN is a specially designed multi-layer perceptron to identify two-dimension shapes
- Therefore dimensional information retained in waveform points is effectively utilized by CNN.
- CNN model due to its characteristics of adaptive feature extraction.

1.4 Problem Definition

- To build an emotion, age and gender recognition system in which when system detects user’s face it will be able to effectively classify user’s characteristics.

1.5 Scope

- In this project, we introduce an approach to classify emotion, gender and age from images of human faces.
- The thoughts of humans are effectively conveyed through emotions which are often uncertain and situation dependent.
- Automatic detection can help to recognize human behavior in real time and avert unwanted events.

1.6 Technology stack

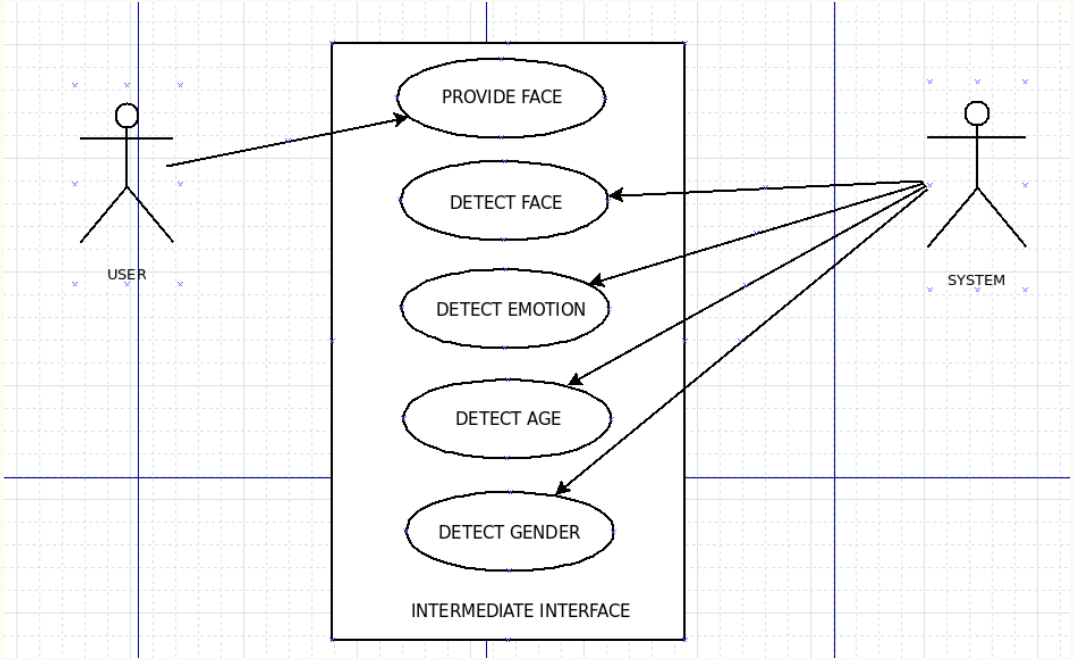
- TensorFlow
- Google Colaboratory
- Python Flask

2. Project Design

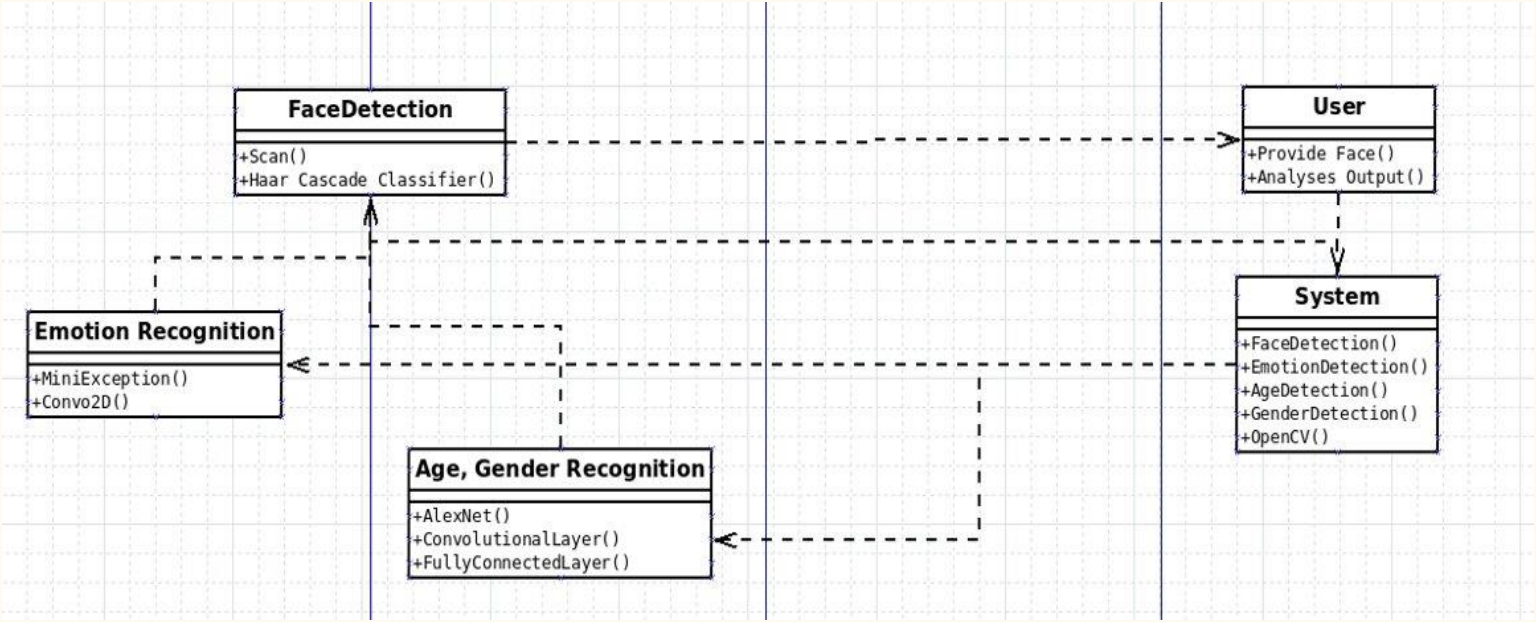
2.1 Proposed System

- We propose a system which will be able to identify facial characteristics of the user while they stand before the camera.
- By closely analyzing the images one could possibly be able to predict the future actions of the user.

2.2 Description Of Use Case



2.3 Class Diagram



2.4 Module-1: Face Detection

- We have used Haar Cascade Classifier to detect a face from a given image.

Module-2: Emotion Recognition

- MiniException Model which uses Convolutional Neural Net is used to identify specific emotion out of the 7 listed emotions.

Module-3: Age and Gender Recognition

- AlexNet Model which also used Convolutional layers is used to identify the age and gender.

2.7 References

1. Gender and Age Classification of Human Faces for Automatic Detection of Anomalous Human Behavior.
   https://doi.org/10.1109/CYBConf.2017.7985780

2. Study on CNN in the recognition of emotion in audio and images.
   https://doi.org/10.1109/ICIS.2016.7550778

3.Planning for next semester

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Planning

- We have successfully implemented the emotion recognition part.
- By the end of next semester we hope to implement the age and gender recognition part completely.

Thank You