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Real Time Age and Gender Prediction

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Abstract: *Recognition of age and gender has become a significant part of the biometric system, protection, and treatment. It is widely used for people to access age-related content. It is used by social media in the distribution of layered advertising and promotions to expand its scope. Application of face detection has grown to a great extent that we should upgrade it using various methods to achieve more accurate results. In this project we have developed a lightweight deep Convolution neural network model for real-time age and gender prediction. For making the training dataset more diverse, Wiki, utkface, and Audience datasets have been merged into one containing 18728 images. Using this vast mixed dataset, we have achieved accuracy of 48.5980.76tested in real-time. Different experimental investigations on the prepared dataset show that with most recent approaches, our model provides competitive prediction accuracy.*

Keywords: Age Classification, Gender Recogonization, Convolutional Neural Networks (CNN), Computer Vision.

I. INTRODUCTION

Human age and gender are considered as important biometric trait for human identification. Age and gender prediction refers to the process of recognizing a person's face in the picture and identifying if a person is male or female and predicting age. These two attributes play a vital role in our social life. Recognition of face attributes in real-time is a very promising research topic. Recent research suggests that the aging characteristics deeply learned from huge data contribute to a substantial improvement in facial image-based age evaluation efficiency. For a growing number of applications, automatic age and gender detection have become important, especially after the rise of social networks and social media.

Build a lightweight CNN model. Train the CNN model using a large combined dataset. Estimate age and predict gender from facial image in real time. The applications of age and gender classification systems have been growing fast in recent years due to its improved technology, deep multi-task learning and OpenCV etc. In this work, we implemented a deep learning Convolutional Neural Network(CNN) solution to age and gender prediction from a single face image combining three datasets with age and gender labels

II. PROPOSED WORK

2.1 CNN Algorithm

A Convolutional Neural Network (ConvNet/CNN) is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other. CNNs are used for image classification and recognition because of its high accuracy. The CNN follows a hierarchical model which works on building a network, like a funnel, and finally gives out a fully-connected layer where all the neurons are connected to each other and the output is processed.

Build a lightweight CNN model. Train the CNN model using a large combined dataset. Estimate age and predict gender from facial image in realtime. The applications of age and gender classification systems have been growing fast in recent years due to its improved technology, deep multi-task learning and OpenCV etc. In this work, we implemented a deep learning Convolutional Neural Network (CNN) solution to age and gender prediction from a single face image combining three datasets with age and gender labels.

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III. UML DIAGRAM

3.1 Flow Chart

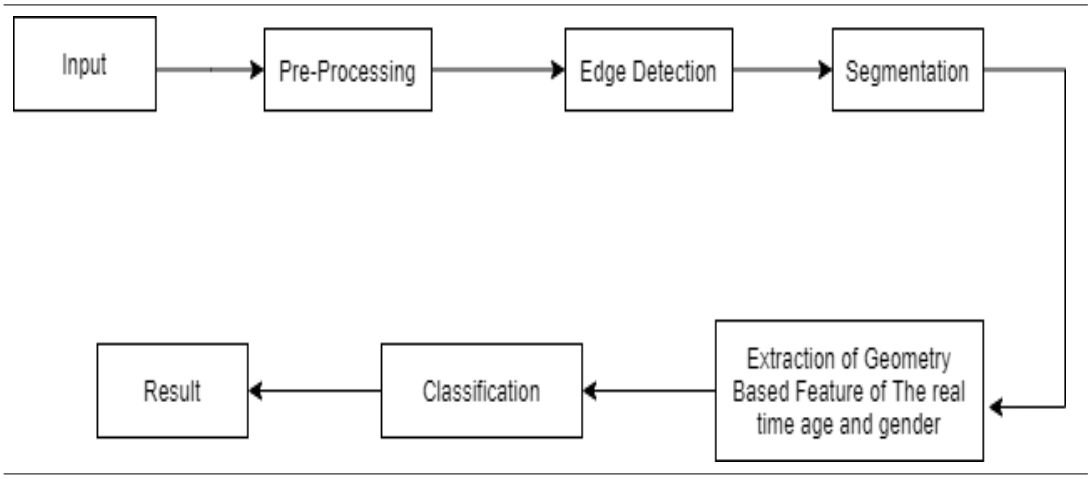

Figure 1: Flowchart for age and gender prediction

3.2 Use Case Diagram

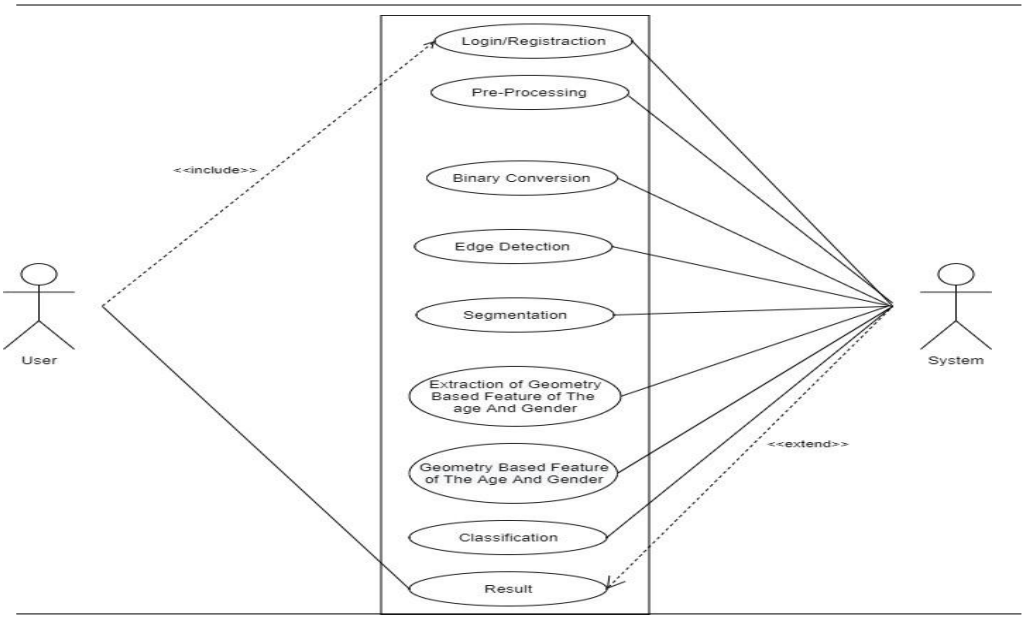

Figure 2: Use Case Diagram for age and gender prediction

IV. HARDWARE AND SOFTWARE REQUIREMENTS

4.1 Software Requirements

IDE: Spyder
Coding Language: Python
Operating System: Window 10

4.2 Hardware Requirements

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Monitor : 15 VGA Color.

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- Mouse : Logitech.
- Ram : 512 Mb

V. APPLICATIONS

- All images are nicely cropped and aligned thus good for quick prototyping.
- Simple to compute, and tolerant to monotonic illumination changes.
- Resembles the mammalian cortex. Invariant to orientation, illumination changes and translation.
- ability to capture color information with low redundancy, invariant.
- Fast calculation speed,50,51 and its ability to capture intensity gradient, direction and spatial frequency.

VI. CONCLUSION

In this project we developed a lightweight CNN model which is ideal to integrate in mobile devices. And we have achieved this without compromising too much accuracy. The model achieved accuracy of 48.59% for age and 80.76% for gender using a large combined dataset. Comparing with other state of the art works, it is clear that the model built on the mixed dataset performs well on unknown data and shows good results on the real-time test. We plan add more datasets from different sources and increase accuracy for age.

VII. ACKNOWLEDGMENT

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