WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Real Time Age and Gender Recognition using CNN

Abhijeet Awad, SanketSontakke, Nikita Narole, Vijay Nikalje, Prof. ArundaeviKhaple

BE Students, Department of Computer Engineering, Zeal College of Engineering and Research, Pune, India

ABSTRACT:

The recognition of age and gender has become crucial in various domains such as biometric systems, security measures, healthcare, and social media advertising. With the increasing demand for accurate face detection, the application of face detection methods has witnessed significant growth. To improve the accuracy of age and gender prediction, various techniques have been explored.In this project, we focus on developing a lightweight Convolutional Neural Network (CNN) model for real-time age and gender prediction. Additionally, we leverage Haar cascades, a popular feature-based method, for face detection. This integration of Haar cascades enhances the accuracy and efficiency of our model by accurately localizing faces in images.

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

I. INTRODUCTION

Human age and gender are considered important biometric traits for human identification. The process of predicting a person's age and gender involves recognizing their face in an image and determining whether they are male or female, as well as estimating their age. These attributes play a significant role in our social interactions and have gained increasing importance with the rise of social networks and social media.Recognizing face attributes in real-time has become a promising research area, and recent studies have shown that leveraging aging characteristics learned from vast amounts of data leads to significant improvements in facial image-based age estimation. Automatic age and gender detection have become crucial for a wide range of applications.In this work, we present a deep learning solution based on a lightweight Convolutional Neural Network (CNN) model for age and gender prediction from a single facial image. Additionally, we utilize Haar cascades, a popular feature-based method, for face detection, which helps in accurately localizing faces in the image.To train our CNN model, we combine three datasets with age and gender labels, creating a comprehensive and diverse training dataset. The availability of tools like OpenCV and the advancements in deep multi-task learning techniques further contribute to the development of accurate and efficient age and gender classification systems.By leveraging the power of CNNs and utilizing Haar cascades for face detection, our model aims to provide real-time age estimation and gender prediction from facial images. The integration of these techniques enhances the accuracy and robustness of the system, making it suitable for various applications, such as biometric identification, security systems, and personalized marketing.This project contributes to the field of age and gender prediction by providing a lightweight CNN model that, in conjunction with Haar cascades, can effectively estimate age and predict gender from facial images in real-time scenarios.

II.MEHODOLOGY

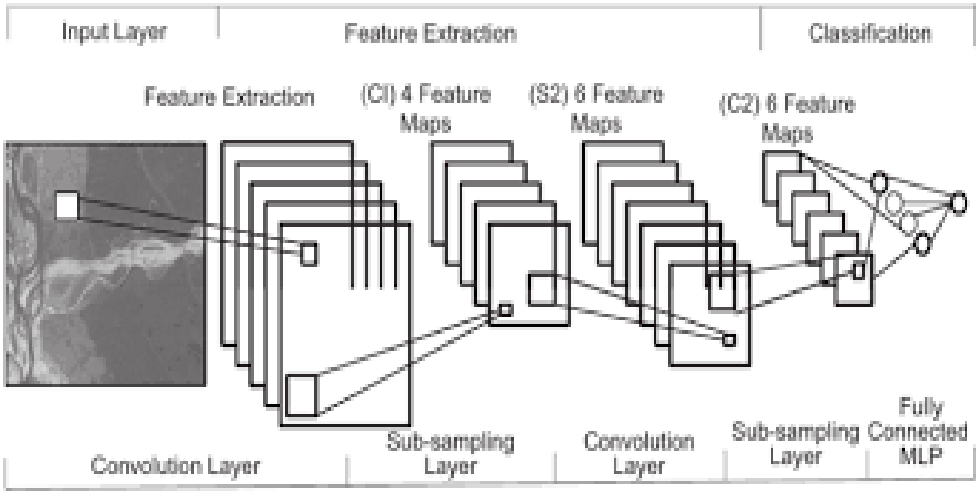
2.1 CNNAlgorithm

A Convolutional Neural Network (ConvNet/CNN) is a powerful Deep Learning algorithm designed to process and classify images. It takes an input image, assigns importance to different features or objects in the image using learnable weights and biases, and can distinguish between them. CNNs have gained popularity for image classification and recognition tasks due to their high accuracy. The architecture of a CNN is hierarchical, resembling a funnel, where the network gradually extracts and combines features from the input image. It concludes with a fully-connected layer, where all the neurons are interconnected and process the final output.

In this project, our aim is to develop a lightweight CNN model for age and gender estimation in real-time. We train the CNN model using a large combined dataset that merges three datasets, each containing age and gender labels. By leveraging a diverse and extensive dataset, we enhance the model's ability to accurately estimate age and predict gender from facial images.

The demand for age and gender classification systems has been rapidly increasing in recent years due to advancements in technology, deep multi-task learning approaches, and the availability of tools like OpenCV. These systems have a wide range of applications, and our work contributes to this field by implementing a deep learning CNN solution for age and gender prediction. By combining three datasets with age and gender labels, we aim to create a robust model that can effectively estimate age and predict gender from a single facial image.Overall, this project showcases the significance of CNNs

in age and gender prediction tasks. With improved technology and techniques like deep multi-task learning, our approach provides accurate and real-time age and gender estimation, contributing to the growing applications of age and gender classification systems.



III. UML DIAGRAM

3.1 FlowChart

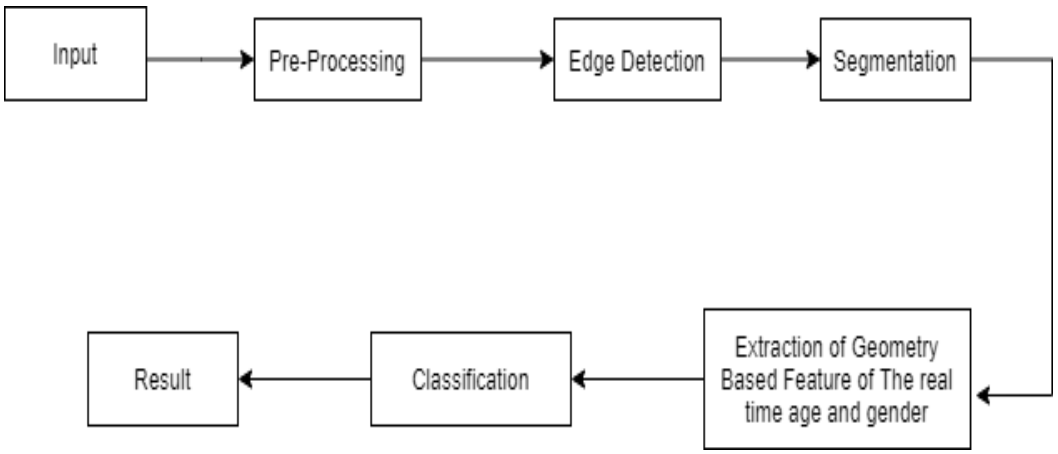


Figure1: Flowchartfor ageandgenderprediction

3.2 UseCaseDiagram

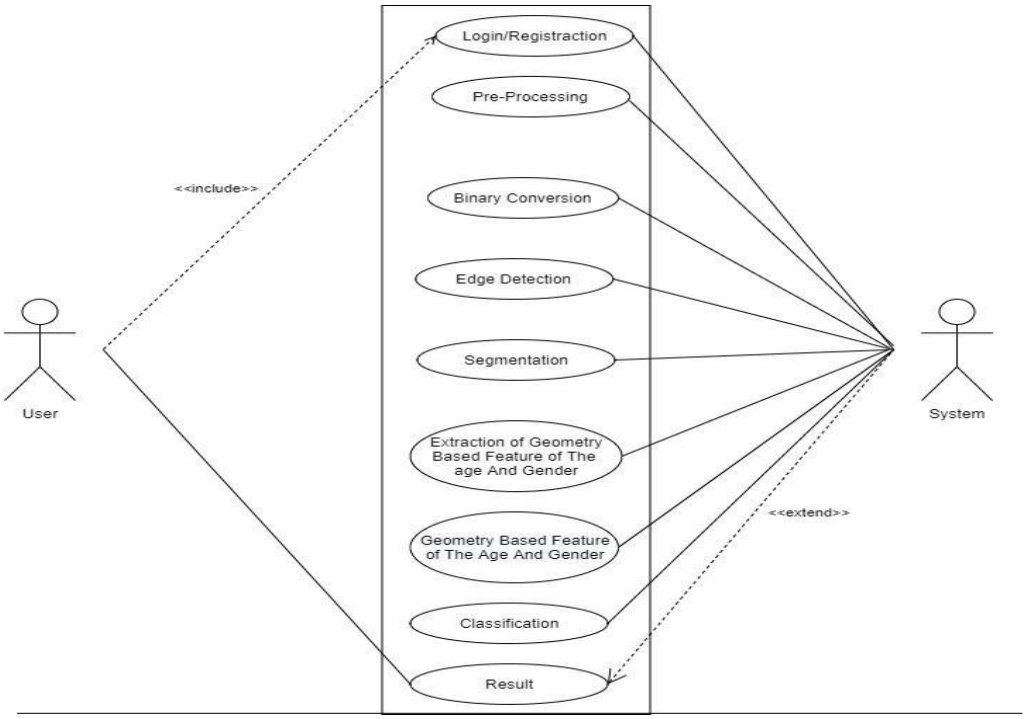


Figure2: Use Case Diagram for age and gender prediction

IV . HARDWARE AND SOFTWAREREQUIREMENTS

4.1 *Software* Requirements

IDE:Spyder
CodingLanguage:Python
OperatingSystem: Window10

4.2 HardwareRequirements

- System:PentiumIV 2.4 GHz.
- HardDisk:40 GB.
- Monitor:15VGAColor.
- Mouse:Logitech.
- Ram:512Mb

V. CONCLUSION AND FUTURE SCOPE

In this project we developed a lightweight CNN model which is ideal to integrate in mobile devices. And we haveachieved 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 onthe mixed dataset performs well on unknown data and shows good results on the real-time test. We plan add moredatasetsfromdifferentsourcesandincreaseaccuracyforage.We also want to develop a smartphone application that can predict gender and age in real-time using the proposed model. And our other idea is to upgrade the model for special cases such as faces with a mask.

ACKNOWLEDGMENT

The authors would like to thank professor of the Department of Computer Engineering in Zeal college of engineering, pune Prof. ArunadeviKhapale for their time and efforts he provided throughout the project and his advice andsuggestions werereallyhelpfultous.

REFERENCES

[1].J. Brownlee, "How to Perform Face Detection with Deep Learning," Machine Learning Mastery, Jun. 02, 2019

[2]. S. Manasa, J. S. Abraham, A. Sharma, and K. Himapoornashree, "Age, gender and emotion detection using cnn," International Journal of Advanced Research in Computer Science, vol. 11, no. Special Issue 1, p. 68, 2020.

[3]. A. Voulodimos, N. Doulamis, A. Doulamis, and E. Protopapadakis, "Deep Learning for Computer Vision: A Brief Review," Computational Intelligence and Neuroscience, Feb. 01, 2018. (accessed Jul. 14, 2020).

[4]. Y.-L.Boureau,J.Ponce,andY.LeCun,"ATheoreticalAnalysisofFeaturePoolinginVisualRecognition,"p.8,2010.

[5. O. Agbo-Ajala and S. Viriri, "Deeply learned classifiers for age and gender predictions of unfiltered faces," The Scientific World Journal, vol. 2020, 2020.

[6]. A. Kharchevnikova and A. V. Savchenko, "Neural networks in videobasedageand gender recognition onmobileplatforms,"OpticalMemoryandNeuralNetworks,vol.27,no.4,pp.246–259,2018.

[7]. C. B. Ng, Y. H. Tay, and B.-M. Goi, "Recognizing Human Gender in ComputerVision: A Survey," in PRICAI 2012: Trends in Artificial Intelligence, Berlin, Heidelberg, 2012, pp. 335–346, doi: 10.1007/978-3- 642-32695-03