

Real-Time Age and Gender Prediction

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Abstract:- Age and gender identification have grown to be important components of the biometric system, protection, and care. People frequently use it to get age-appropriate content. Social media makes use of it to broaden the reach of multilayer advertising and promotions. Face detection has become so widely used that we need to improve it using a variety of techniques to get more accurate results. We have created a lightweight deep Convolution neural network model for age and generation prediction in this paper. Wiki, UTK Face and Adience datasets have been combined to create a single dataset of 18728 photos in order to increase the diversity of the training dataset. With this sizable mixed dataset, we were able to attain a real-time accuracy of 48.5980.76. several experimental studies.

Keywords:- CNN(Convolution neural network), Age Prediction, Gender Prediction, Biometric System, Face Detection.

I. INTRODUCTION

Identification based on age and gender has become a crucial part of the biometric system, protection, and care. It is widely used by people to get age-appropriate content. It is used by social media to increase the reach of multilayer promotions and advertising. We need to apply a variety of strategies to improve face detection because it is now being used so frequently. In this paper, we develop a lightweight deep convolution neural network model for predicting generation and age. To broaden the diversity of the training dataset, the Wiki, UTK Face, and Adience datasets were pooled to provide a single dataset of 18728 images.

II. LITERATURE REVIEW

➤ **Paper Name:** *A Light weight Deep Convolutional Neural Network Model for Real-Time Age and Gender Prediction.*

• **Author:** Md. Nahidul Islam Opu, Tanha Kabir Koly, Annesha Das and Ashim Dey.

• **Abstract:** Age and gender identification have grown to be important components of the biometric system, protection, and care. People frequently use it to get age-appropriate content. Social media uses it to spread multilayer advertising and promotions and broaden its reach. Face detection has become so widely used that we need to improve it using a variety of techniques to get more accurate results. We have created a lightweight deep Convolution neural network model for

age and gender prediction in this paper. Wiki, UTKFace, and Adience datasets were combined to create a single collection of 18728 photos in order to increase the diversity of the training dataset. With this sizable mixed dataset, we were able to attain a real-time accuracy of 48.5980.76. several experimental studies.

➤ **Paper Name:** *Use of Ensemble Modeling to Predict Age, Makeup, and Illumination from Faces.*

• **Author:** Kundan Nigam, Sahil Sharma

• **Abstract:** Classification based on factors like gender, appearance, age, and lighting has grown in importance and potency for real-time applications. However, when compared in terms of optimization, the performance of the current method is weak. To achieve more optimal findings, we used a variety of machine learning models in our study article. We attempt to create ensemble algorithms for reliable age classification ranges, which are divided into four groups: child, young, middle, and old. Similar to how makeup classification ranges are split into partial makeup and over makeup, gender classification ranges are split into male and female, while illumination classification ranges are define.

➤ **Paper Name:** *"Gender and Age based Census System for Metropolitan Cities,"*

• **Author** Shiv Mittal and Vikram Singh Rajput's

• **Abstract:** This study describes a clever computer-vision system that determines a person's legal age and gender, stores the information for census purposes, and aids in ensuring orderly entry of people into locations. Deep learning-based facial image classifiers are used in the system to instantly determine a person's gender and age from an image of their face. The computer vision algorithm's prediction is used to generate the actuating reaction, and it also maintains track of all faces it encounters and the number of people who have those faces in common. You may monitor the log of the entire surveillance process online.

➤ **Paper Name:** *Real-Time CNN and ResNet Gender Classification and Age Prediction.*

• **Author:** Asad Mustafa, Kevin Meehan

• **Abstract:** The face is the most prominent element of the human body, and we can learn a lot about someone's identity from their facial traits, including age prediction

and gender categorization. Computer vision (CV) is currently being used to teach machines how to understand and see the actual world. This study presents a unique artefact that uses a live stream from a camera source to recognize faces, categorize genders, and age-predict from human facial photos. The Keras CV library and Convolutional Neural Networks (CNN) have both been utilized for training. This innovative study relies on each features.

➤ **Paper Name:** Human Age And Gender Classification using Convolutional Neural Network

- **Author:** Mohammed Kamel Benkaddour
- **Abstract:** The development of intelligent systems capable of effectively learning and recognising objects is the major goal of the very active research fields of pattern recognition and automatic classification. The usage of biometrics, which is generally utilised for security considerations, is integral to these applications. In the realm of research, the face modality has grown in importance as a basic biometric technique. The objective of this work is to create a system for estimating age and gender from a facial image or real-time video using convolutional neural networks. In this study, three CNN network models with various architectures (number of filters, number of convolution layers).

III. METHODOLOGY

A. CNN ALGORITHM:

Convolutional Neural Networks with a focus on image and video recognition applications. CNN is primarily utilized for image analysis applications such segmentation, object detection, and picture recognition.

Convolutional Neural Networks have three different kinds of layers:

- **Convolutional Layer:** Each input neuron in a conventional neural network is connected to the following hidden layer. Only a small portion of the input layer neurons in CNN are connected to the hidden layer of neurons.
- **Pooling Layer:** The pooling layer is used to make the feature map less dimensional. Inside the CNN's hidden layer, there will be numerous activation and pooling layers.
- **Fully Connected Layer:** Fully Connected Tiers make up the network's final few layers. The output from the last pooling or convolutional layer is passed into the fully connected layer, where it is flattened before being applied

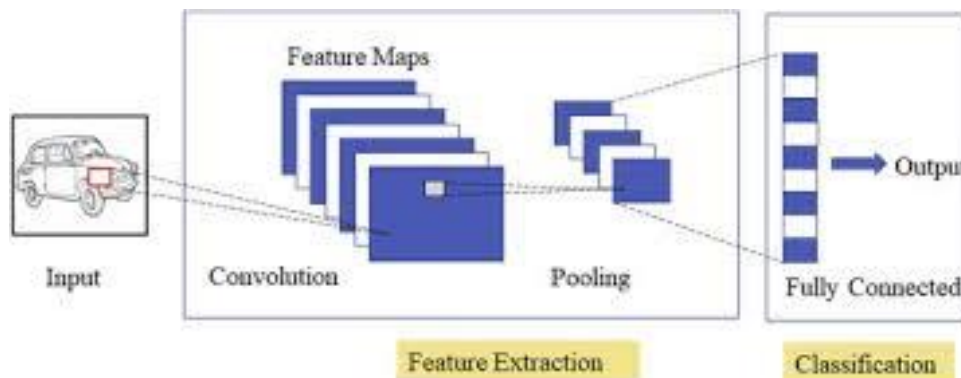


Fig. 1: CNN ALGORITHM

IV. GUI IMPLEMENTATION

A. WELCOME PAGE



Fig. 2: Welcome Page

B. HOME PAGE

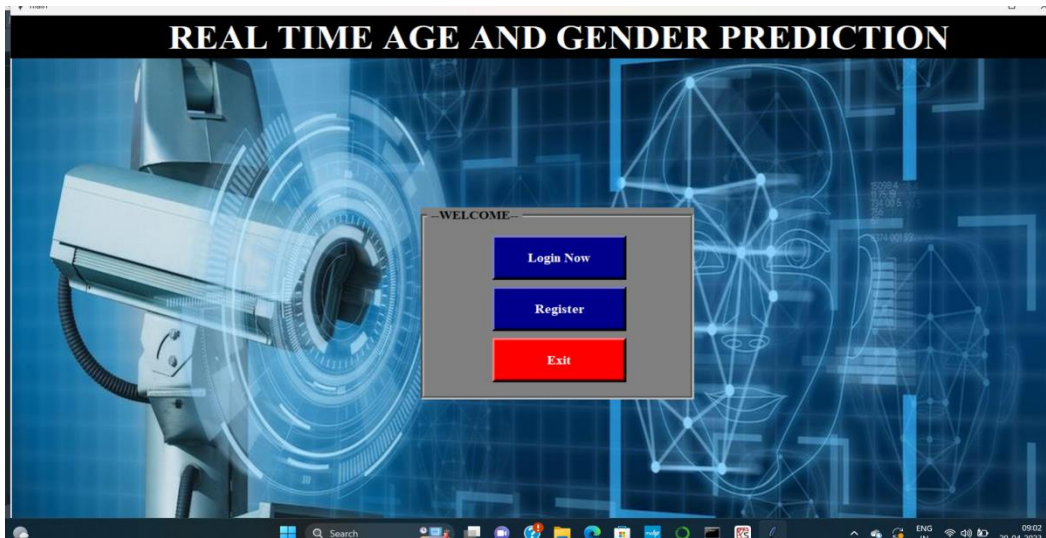


Fig. 3: Home Page

C. LOGIN PAGE:

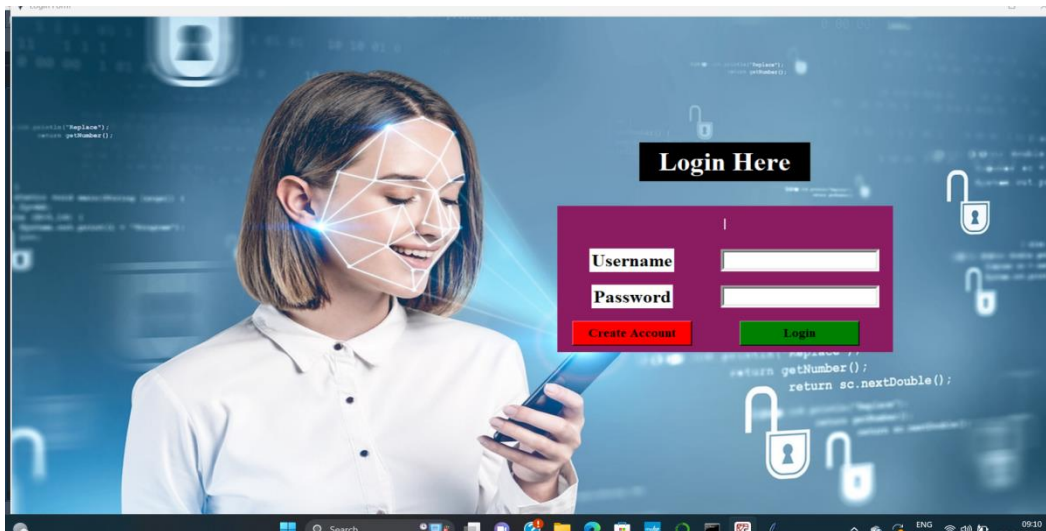


Fig. 4: Login Page

D. REGISTRATION PAGE



Fig. 5: Registration Page

V. RESULTS

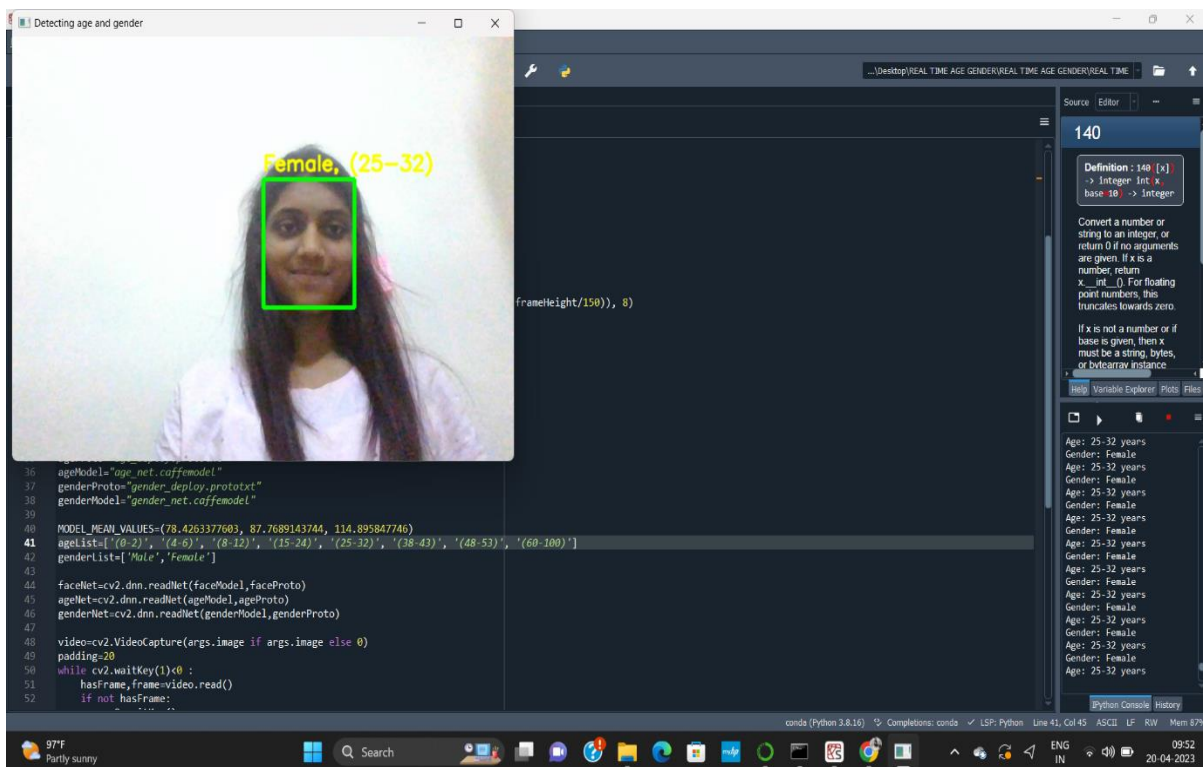


Fig. 6: Result For Input 1

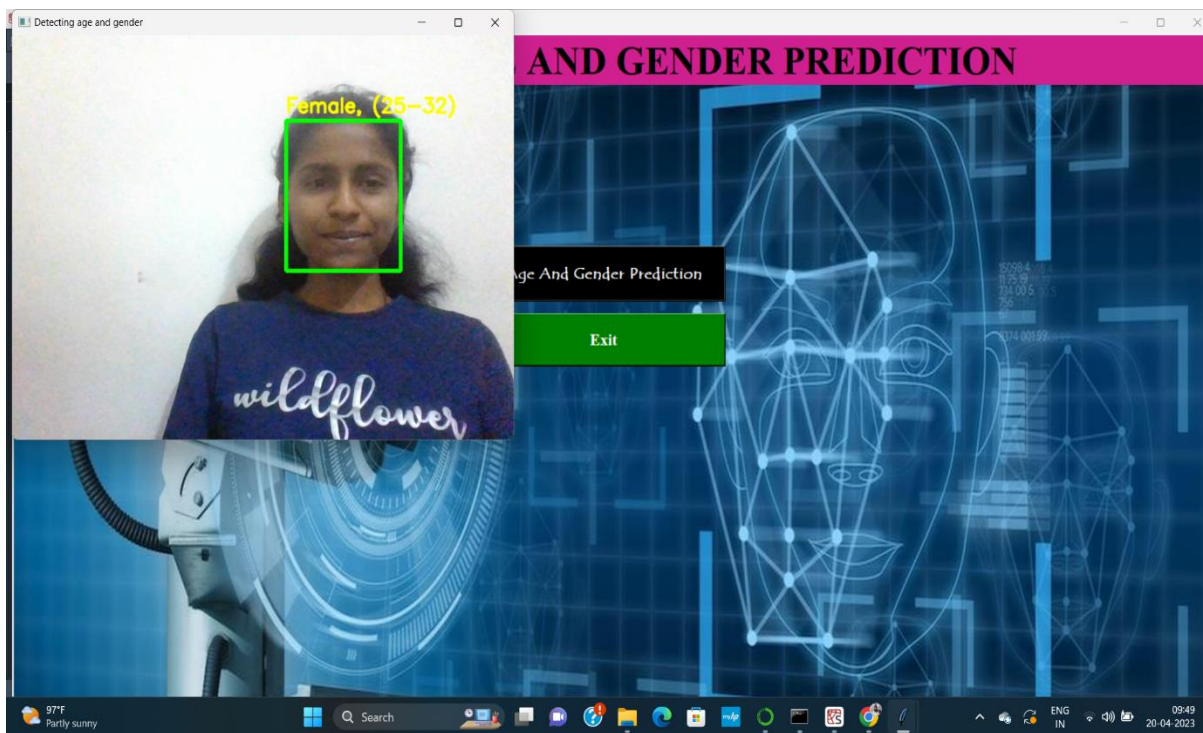


Fig. 7: Result For Input 2

VI. CONCLUSION

In conclusion, the real-time age and gender prediction project using a Convolutional Neural Network (CNN) demonstrates the ability to accurately predict the age and gender of individuals in real-time. By leveraging the power of deep learning and computer vision techniques, the CNN model is capable of analyzing facial features and patterns,

allowing for reliable age and gender estimation. This project holds promising potential for various applications such as targeted advertising, customer analysis, and human-computer interaction systems. However, further refinement and evaluation are necessary to enhance the model's robustness and generalizability across diverse populations and environmental conditions.

VII. FUTURE SCOPE

When changing a dataset, the same model can be trained to predict the feelings of race etc. Age and gender classifications can be used to predict age and gender in uncontrolled real-time situations such as train stations, banks, buses, airports, etc. For example, depending on the number of male and female passengers by the age on the train station, toilets and restrooms can be built to facilitate transportation. Additionally, we'd like to improve the model to account for unique situations like mask-covered faces.

REFERENCES

- [1.] J. Brownlee, "How to Perform Face Detection with Deep Learning," *Machine Learning Mastery*, Jun. 02, 2019.
- [2.] W. Ouyang et al., "DeepID-Net: Object Detection with Deformable Part Based Convolutional Neural Networks," *IEEE Trans. Pattern Anal. Mach. Intell.*, vol. 39, no. 7, pp. 1320–1334, Jul. 2017, doi: 10.1109/TPAMI.2016.2587642.
- [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, and Y. LeCun, "A Theoretical Analysis of Feature Pooling in Visual Recognition," p. 8, 2010.
- [5.] 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.
- [6.] O. Agbo-Ajala and S. Viriri, "Deeply learned classifiers for age and gender predictions of unfiltered faces," *The Scientific World Journal*, vol. 2020, 2020.
- [7.] A. Kharchevnikova and A. V. Savchenko, "Neural networks in videobased age and gender recognition on mobile platforms," *Optical Memory and Neural Networks*, vol. 27, no. 4, pp. 246–259, 2018.
- [8.] M. Dileep and A. Danti, "Human age and gender prediction based on neural networks and three sigma control limits," *Applied Artificial Intelligence*, vol. 32, no. 3, pp. 281–292, 2018.
- [9.] Z. Zhang, Y. Song, and H. Qi, "Age progression/regression by conditional adversarial autoencoder," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. IEEE, 2017
- [10.] C. B. Ng, Y. H. Tay, and B.-M. Goi, "Recognizing Human Gender in Computer Vision: A Survey," in *PRICAI 2012: Trends in Artificial Intelligence*, Berlin, Heidelberg, 2012, pp. 335–346, doi: 10.1007/978-3-642-32695-031.