



“Age Estimation And Gender Prediction Using Deep Learning”

¹Rutuja Kadam, ²Dipti More, ³Vaishnavi Patil

BTech Final Year Students

¹Electronics and Telecommunication Engineering,

¹Shri Vittal Education and Research Institute Pandharpur, Pandharpur, India

Abstract: Predictions regarding the age of artificial intelligence can be applied across various domains, including advancements in smart human-machine interfaces, healthcare, beauty products, and e-commerce. One ongoing and actively researched area is the ability to predict people's gender and age based on their facial images. The proliferation of social media usage and the vast amount of content shared online necessitate automated methods for detecting the age and gender of individuals behind the messages. In this study, coevolutionary neural networks were employed to train face images of individuals, resulting in highly successful predictions of age and gender. These images encompass a diverse range of poses, facial expressions, lighting conditions, occlusions, and resolutions.

Key Words: Age; Machine learning; facial recognition; features extraction; image processing

I. INTRODUCTION

The objective of this project is to utilize image datasets to predict the age of individuals. With the rise of social networks and social media, there is an increasing focus on automatic age classification in numerous applications. Age and gender represent the fundamental facial attributes crucial in social interactions. In various smart applications such as access control, human-computer interaction, law enforcement, marketing intelligence, and visual surveillance, accurate age estimation from a single facial image is paramount. The primary technologies employed in this project are machine learning techniques like supervised learning, image recognition, and deep learning, particularly utilizing cutting-edge neural networks and profound learning methodologies. Supervised learning involves mapping input to output through training data comprising input-output pairs, making it a fundamental aspect of this machine learning approach.

II. OBJECTIVES

- 1) To ascertain an individual's age by analysing diverse visual cues, including facial features, skin texture, and other physical characteristics.
- 2) Guarantee the resilience and generalizability of the age recognition model across diverse scenarios, encompassing varying lighting conditions, poses, facial expressions, and ethnic backgrounds.
- 3) When relevant to the application, strive to create a model capable of delivering real-time age predictions.
- 4) Design an interface that facilitates users in effortlessly uploading images for age estimation, ensuring they receive prompt and comprehensible results.

III. NEED OF PROJECT

Age recognition has the potential to bolster security systems by limiting access to authorized age groups, such as in restricted areas or for age-restricted products. With the widespread adoption of internet resources and the massive volume of data shared online, much of it has become untrustworthy and unrecognized by individuals. This project aims to detect such content and classify individuals based on their age and gender, providing a means to regulate and prevent such activities.

IV. SCOPE OF PROJECT

The potential for future deep learning-based age recognition projects is promising and expected to broaden across different domains, driven by technological advancements and evolving societal demands. Some potential future directions for age recognition projects could include personalized healthcare, detection of age-related diseases, and long-term identity verification.

V. PROPOSED METHODOLOGY

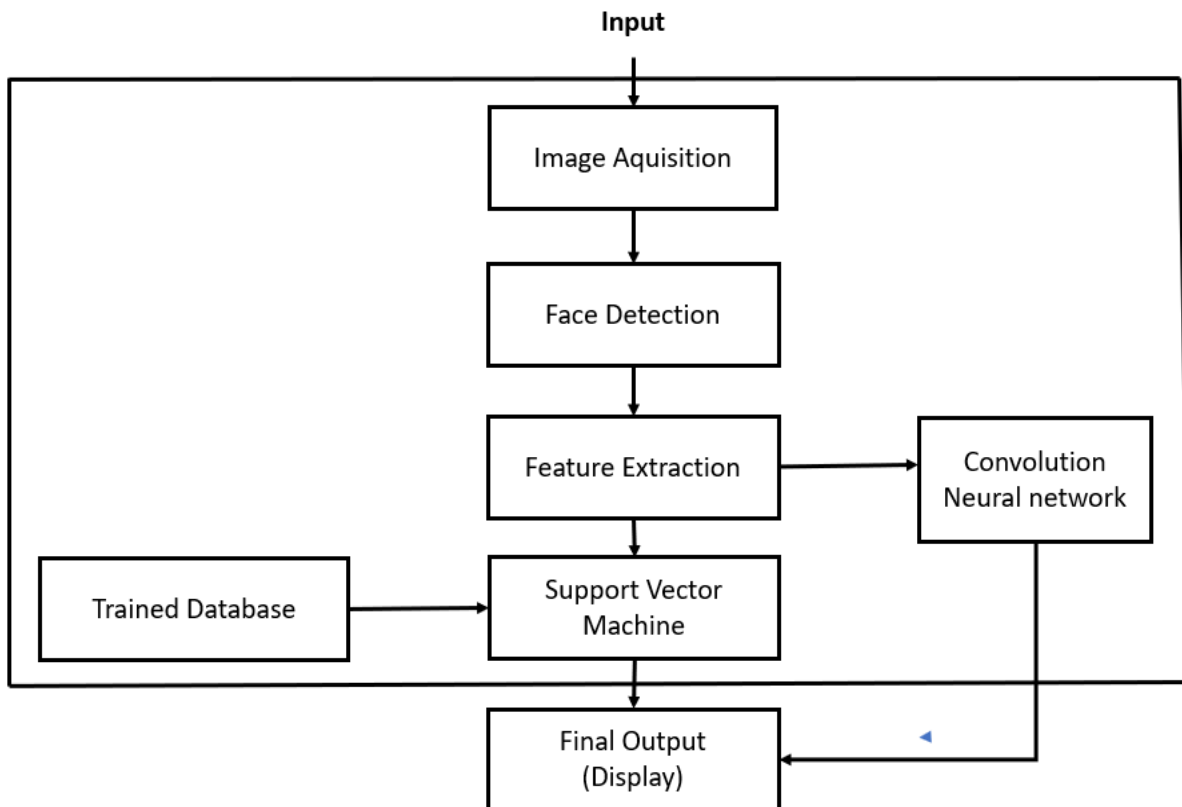


Fig) Flow Chart

To predict the age, we are going to use a convolutional neural Architecture of the network (CNN). This CNN uses 3 layers of convolution and 2 layers with one final output layer.

Age detection is the process of automatically discerning the age of a person solely from a photo of their face. Typically, you will see age detection implemented as a two-stage process:

Stage 1: Detect faces in the input image/video stream

Stage 2: Extract the face Region of Interest (ROI), and apply the age detector algorithm to predict the age of the person.

For Stage 1, any face detector capable of producing bounding boxes for faces in an image can be used.

Once your face detector has produced the bounding box coordinates of the face in the image/video stream, you can move on to Stage 2 — identifying the age of the person.

PROCEDURE

Since the technique is implemented, we can start testing it for its accuracy. The general procedure to be followed is,

- Input the data.
- Create a frame.
- Detect the face.
- Classify the Age Group.
- Classify the Gender.
- Attach the result in the image.
- Output the image in specified location.

VI. RESULT

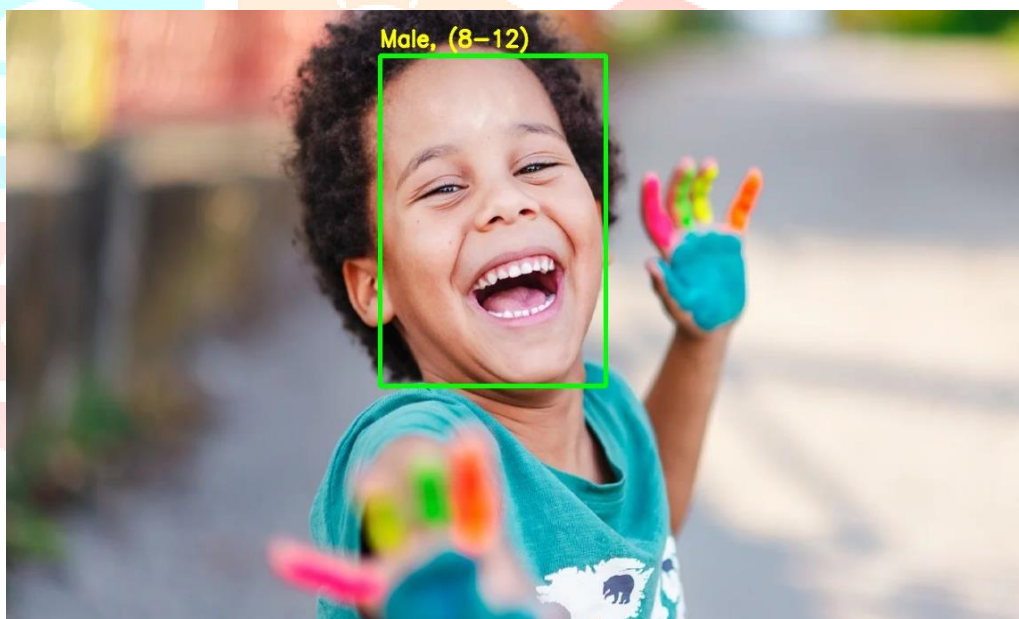


Fig) Example of sample output

VII. APPLICATIONS

- Identification of the target audience in marketing organization.
- In Recruitment procedure, to verify legitimacy of the applicants.
- In the banking industry, age and gender detection can be used to extract information about an individual from photos.
- Verification of authentic person applying for government IDs.
- Classification of human resources in bulk.

- Retailers can utilize this technology to provide personalized shopping experiences, recommend products, and analyze customer demographics for targeted marketing
- Research and Data Analysis: Age and gender recognition can be used to analyse demographic trends and patterns in various industries, helping companies make data-driven decisions.

VIII. CONCLUSION

"Age and gender classification in humans" are two crucial pieces of information that can be gathered from an individual. Human faces contain a wealth of data that can be utilized for various purposes. Achieving accurate human age and gender classification is vital for targeting the right audience. In this project, we aimed to achieve this using readily available equipment. The algorithm's effectiveness depends on several factors, but the primary goal of this project is to ensure ease and speed while maintaining high accuracy. Efforts are underway to enhance the algorithm's efficiency, including filtering out non-human objects from facial data, expanding datasets to include diverse ethnic groups, and refining the algorithm's workflow for better control. These improvements will contribute to a more robust and effective age and gender classification system.

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