

# **An Intelligent Age Classification And Gender Prediction Using Deep Learning**

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**ABSTRACT:** The proliferation of social media and networking sites has led to an increase in the number of apps requiring age and gender categorization based only on user input. We all know that age and gender are two of the most telling face characteristics in everyday encounters. Audience-based deep learning. Additionally, to acquire the best possible forecasts and outcome by avoiding the issues of precision and speed. In addition, we can see the broad range of possible uses for this technology, from security services like CCTV monitoring and police work to dating apps and matrimony websites.

**key words:** Clustered Neural Network, Deep Learning, Age Prediction, and Gender Identification.

## **1. INTRODUCTION**

2. For many years, processing face images of humans has been a hot topic in the field of computer vision. Since human faces give a lot of information, numerous themes have received lots of attentions and hence have been researched thoroughly. Careful thought and research must go into creating a digital image. There are two major phases in image processing, followed by many simpler phases. Image enhancements that make higher-quality versions of the image available for use in other software are known as "picture upgrades." The alternative method is the most used approach of data extraction from images. Segmentation is a method used to divide pictures into distinct regions. There are a variety of methods necessary for solving the problem. With a facial recognition system, you can: There is a wealth of information stored in the expressions on people's faces. When two people interact, they share a lot of thoughts and feelings with one other. The development of new concepts aids in the identification of limits. The evaluation of age is a multi-class problem in which several groups of years are defined. Different people of different ages have different face structures, making it challenging to match up the images. As a highly sociable species, humans rely heavily on accurate gender perception in a variety of social interactions, making age and gender categorization a crucial visual job. One of the most useful pieces of data for determining someone's age or gender is the appearance of their face. There are several instances when security agents lack a detailed explanation of thesearch for a wanted criminal, our algorithm may be useful and assist the authorities.

## **3. LITERATURE REVIEW**

Automatic age and gender classification has become relevant to an increasing amount of applications, particularly since the rise of social platforms and social media. Nevertheless, performance of existing methods on real-world images is still significantly lacking, especially when compared to the tremendous leaps in performance recently reported for the related task of face recognition. In this paper we show that by learning representations through the use of deep-

convolution neural networks (CNN), a significant increase in performance can be obtained on these tasks. To this end, we propose a simple convolution net architecture that can be used even when the amount of learning data is limited. We evaluate our method on the recent Audience benchmark for age and gender estimation and show it to dramatically outperform current state-of-the-art methods.

#### **4. EXISTING SYSTEM**

The extent that the 21st century is the crack of the dawn for unimaginable achievements. The aforementioned technology can be used for our benefit in identifying one's age and even their gender just based on their glimpse from a camera, image and even a video. This research paper will methodically chalk out the whole procedure, multiple methodologies and algorithms that can be used, which one is the most accurate and how it all comes together. It will also stress on its importance and how it can be implemented to benefit our day to day life.

The paramount objective of the paper is to build a gender and age detector.

##### **DISADVANTAGES:**

- The most effective predictions and result by overcoming the problem of accuracy and time.
- Over fitting is common problem when machine learning based methods are used on such small image collections.

#### **5. PROPOSED SYSTEM**

Proposed methodology is experimented on database of the faces of people with different age groups viz. children, middle, and old age people, and genders classified into male and female. Database has been considered for the experiments. Along with the database, own image database has been developed by taking the pictures from the internet. There are 1000 grayscale facial images in this database. Among 1000 facial images, 700 images are used as Training dataset and remaining are considered for testing purpose. Each image is normalized to a size of  $64 \times 64$  dimensions.

The proposed system obtains the input from the dataset or through the real-time camera. Preprocessing is carried out to make it ready for further processing. DCNN (Deep Convolution Neural Network) is performed on the preprocessed image to retrieve the important features. The gender has 2 classes (male and female), and age of a person is classified into 8 age classes as “0–2,” “4–6,” “8–13,” “15–20,” “25–32,” “38–43,” “48–

53,” and “60+” which is classified using support vector machine (SVM). The recommendation system provides nutritional advice based on the age and gender predicted for the individual.

## 6. ARCHITECTURE

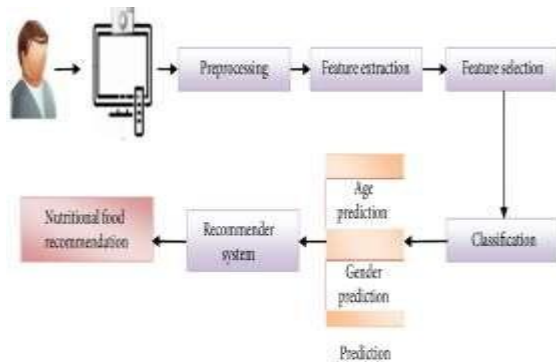


Fig 1: Architecture

## 7. IMPLEMENTATION

**Input Processing Module:** The input image is fed into the input processing module, where it is preprocessed to make it suitable for further analysis. Preprocessing includes operations such as resizing, normalization, and data augmentation.

**Feature Extraction Module:** The feature extraction module extracts relevant features from the preprocessed image. Convolution neural networks (CNNs) are commonly used for feature extraction in deep learning. The CNN consists of multiple layers of convolutional and pooling operations that can capture spatial features in the image.

**Output Module:** The output module takes the output from the classification module and presents it in a user-friendly format. This module may include a graphical user interface (GUI) that displays the age and gender of the person in the image.

## 8. METHODOLOGY

Proposed algorithm for gender prediction from the given image is as given below: Input: query face I

Output: determine gender, i.e. male or female

**Step 1:** Input all n face images to train the neural network and query image I.

**Step 2:** Set the target T for the classification of two gender categories and three age categories.

**Step 3:** Train the neural network N.

**Step 4:** Determine the male gender

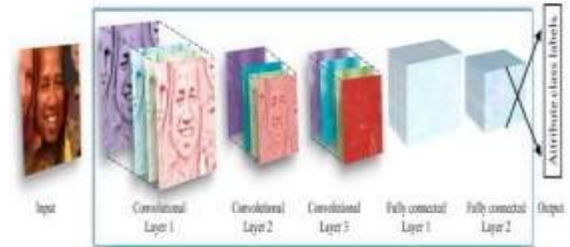
**Step 5:** Determine the male gender class in finer level by three-sigma control limits using the mean and equation where  $\mu$  are lower and upper limit controls determined using the equation where  $\sigma$  standard deviation

**Step 6:** Repeat the step 1–5 for female gender, children age, middle age and old age classes.

**Step 7:** Based on the range to which value belongs in finer level, the conclusion can be drawn that, the test image belongs to that specific class of gender and age.

### DEEP CNN

The tasks tackled using the deep CNN approach include age and gender classification and age estimation. The basic structure of each of the 3 models includes a series of convolution blocks, followed by a set of FC (fully connected) layers for classification and regression. An RGB



**Fig 2:** Working of CNN with images for Gender recognition

Image is fed to the model and is resized to  $180 \times 180 \times 3$ . Every architecture comprises convolution blocks that are a stack of convolution layers (filter size is  $3 \times 3$ ) followed by non-linear activation „ReLU“, max pooling ( $2 \times 2$ ) and batch normalization to mitigate the problem of covariate shift. The deeper layers here also have spatial dropout (drop value of 0.15-0.2) which drops entire feature maps to promote independence between them. Following the convolution blocks, the output is flattened before feeding that into FC layers. These FC layers have activation function of ReLU, dropout (value between 0.2 & 0.4) and batch normalization. Used for age estimation. The architectures for age classification and gender classification

## 9. RESULT



## 10. CONCLUSION

Age and Gender Classification are two of the most essential resources for getting information from an individual. Human faces contain enough information to be useful for a variety of purposes. Human age and gender classification are critical for reaching the right audience. The algorithm's efficiency is determined by a number of factors, Work is being done to improve the algorithm's efficiency. Deep learning and CNN could be used to improve this

prototype's ability to reliably identify a person's gender and age range out of a single image of their face. From this study, we can conclude with two important conclusions. First, despite the limited availability of age and gender-tagged photos, CNN can be used to improve age and gender detection outcomes. Second, by employing additional training data and more complex systems, the system's performance can be slightly increased.

## **FUTURE SCOPE**

Recently we came across AI software application which is used to detect age and gender. App that determines your age from your photos using facial recognition. It can guess your age and gender along with that can also find multiple faces in a picture and estimate the age for each face.

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