

# Age And Gender Detection Using Deep Learning

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**Abstract:** - Age and gender classification has become applicable to an extending measure of applications, particularly resulting to the ascent of social platforms and social media. Regardless, execution of existing strategies on real-world images is still fundamentally missing, especially when considered the immense bounced in execution starting late reported for the related task of face acknowledgment. In this project we exhibit that by learning representations through the use of significant Convolutional Neural Network (CNN) is used to extract the features from the input images and classifies the intermediate results. After all this, there is a development of a deep learning model which is totally based on the CNN. Along with CNN and OpenCV we combine the publicly available datasets (such as UTK faces, Facial image) into a large set and train for best method. The main objective of this project is to build a gender and age detector that can predict the gender and age of a person's face in an image using deep learning on an audience dataset Based on our results, we develop applications for age and gender prediction.

**Key Words:** - *Age and Gender prediction, Convolutional Neural Networks, Deep learning, VGG.*

## I. INTRODUCTION

Age and gender, two main facemask attributes, play a very early role in social communication, making age and gender estimation from an image an important task in intelligent applications such as access control, human-computer interaction, law enforcement, marketing. Intelligence and visual observation, etc. This can be used to understand the user's age and gender, and this information can be used to create an improved product and experience for each user.

It plays an important role in marketing for the marketer by addressing the target audience on the basis of age and gender. Age recognition plays an important role in police investigation and intelligence department as it helps in finding the real suspect based on his age.

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They can get a filtered result of a person who has committed a criminal act or any other activity. If a person gives a biased opinion about his age after getting the result from the age detection software, the actual age and the estimated age will be approximately the same which tells about his reliability and this reliability makes him a reliable factor for many other useful operations in daily life.

Many properties can be predicted from face image, viz age, gender, expression, ethnicity or emotion. one of the most Significant characteristics are age and gender. It is easy to imagine possible application from human computer interaction to marketing security system. Here are various methods to solve the problem of exact estimation mating age and sex. The first approach relies on manual extract characteristics such as head shape, eye position or length of the nose. Another approach is based on end-to-end deep learning.

The two methods can be combined to create a new composite model approach. Most modern methods use deep learning methods. Age and gender must be labelled to train the model. There are many publicly available datasets including age or gender datasets. Another option is to manually create a new dataset labelling face image.

## A. Abbreviations and Acronyms

DL - Deep Learning

CNN - Convolutional Neural Network HDD- Hard disk drive

## II. LITERATURE REVIEW

Literature review for age and gender detection: References

[7] With the advancement in technology, the use of smart gadgets has increased and social media has started grabbing everyone's attention. Deep learning is an artificial intelligence technology that mimics the functioning of human cognitive processes through unstructured data collection. The accuracy of its classification techniques, deep learning techniques are various tasks such as classification, feature extraction, object recognition and so on, it helps to predict gender and age. [4] In this paper the author has attempted to bridge the gap between automatic face recognition capabilities and age and gender estimation methods using Deep Convolutional Neural Networks (CNN). They test our network on the newly released Adience benchmark for age and gender classification of unfiltered face images. A Gaussian mixture model (GMM) was used to represent the distribution of facial patches. Age classification consists of Support Vector Machines (SVM) to classify the input image into age-classes and then Support Vector Regression to estimate the exact age. [13] This research addresses the implementation of a model that can predict a person's age and gender from a single facial image. Access control in matrimonial and dating services so that this model can help the firm confirm the user's age and gender and ensure that users are honest. Predicted gender is binary and will be categorized as "male" and "female", and predicted age can range.

## III. METHODOLOGY

### 2.1 Deep Learning

Deep Learning is the Sub Branch of Artificial Intelligence and a subset of Machine Learning which consists of three or more networking layers. Generally, these layers are Neural Networking Layers. As we know, machine learning is the ability of the machines to think like a human and perform the respective tasks in an efficient way.

Similarly Combining abilities of Machine learning with the neural networking models in order to improve the predictions

and the Processing in a step-by-step manner in order to understand the patterns in a better way are the extracting features of Deep Learning which makes it unique from other Algorithms and Technologies.

### 2.2 Convolutional Neural Network (CNN)

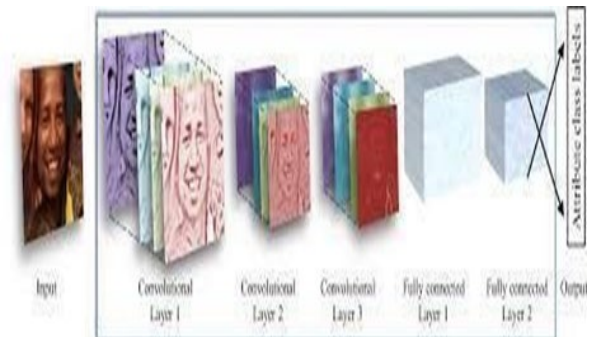


Fig.1. Architecture of CNN

CNN (Convolutional Neural Network) is a type of artificial neural network commonly used for image processing or object recognition and classification. Using CNN, deep learning identifies items in images. A input layers, hidden layers, and output layers are all parts of a standard neural network. Anatomy of CNN inspired by the brain. Artificial neurons or nodes in a CNN collect inputs, process them and produce results. As an output, it acts rather like a neuron inside the brain and transmits signals between cells. Image used as a source of data. A CNN may contain multiple hidden layers, each of which performs a function calculating and subtracting from an image. The very first layer that extracts feature out of an input image is convolution. The object is classified and identified in the output layer by the fully connected layer. The convolutional layer is the most important constituent of CNN. The mathematical procedure of convolution is used to combine two sources of data.

Gender prediction from social image collections, which are not images. Requires access to private details of subject areas not displayed in images, such as their birth date, and general approaches that include the collection of other information about an individual. Based on which we detect gender on manually manipulated annotation data for gender recognition. Overfitting is common a minor problem. This comes into play when deep learning or machine learning- based approaches are applied to the dataset with such a small number of face images.

## 2.3 Software Requirements:

### 2.3.1 Visual Studio Code version: 1.70:

Visual Studio Code is a streamlined code editor with support for development operations like debugging, task running, and version control. It aims to provide just the tools a developer needs for a quick code- build-debug cycle and leaves more complex workflows to fuller featured IDEs, such as Visual Studio IDE.

### 2.3.2 Python:

Python is an interpreted, high-level, general purpose programming Language by Guido Van Rossum and first released in 1991, Its language constructs and object- oriented approach aim to help programmers write clear, logical code for small and large- scale projects.

### 2.3.3 Keras:

Keras is an open-source software library that provides a Python interface for artificial neural networks.Keras is a host of tools to make working with image and text data easier. Keras has support for convolutional and recurrent neural networks

### 2.3.4 Tensor flow:

Google designed and released TensorFlow, Python A library for fast numerical computation. It is a foundation. A library that is mainly used to develop directly deep learning model, while wrapper libraries are occasional.

### 2.3.5 PHP:

PHP (Hypertext Preprocessor) is known as a general-purpose scripting language that can be used to develop dynamic and interactive websites. It was among the first server-side languages that could be embedded into HTML, making it easier to add functionality to web pages without needing to call external files for data.

### 2.3.6 Javascript:

Javascript is used by programmers across the world to create dynamic and interactive web content like applications and browsers. JavaScript is so popular that it's the most used programming language in the world, used as a client-side programming language by 97.0% of all websites.

### 2.3.7 HTML5:

The technology market being saturated with smart devices with different screen sizes and resolutions, HTML5 allows users to have a consistent web experience across multiple devices. This

has become increasingly vital since Google confirmed that global search traffic is now predominantly performed on mobile.

### 2.3.8 CSS3:

Cascading Style Sheets Level 3 (CSS3) is the iteration of the CSS standard used in the styling and formatting of Web pages. CSS3 incorporates the CSS2 standard with some changes and improvements. A key change is the division of standard into separate modules, which makes it easier to learn and understand.

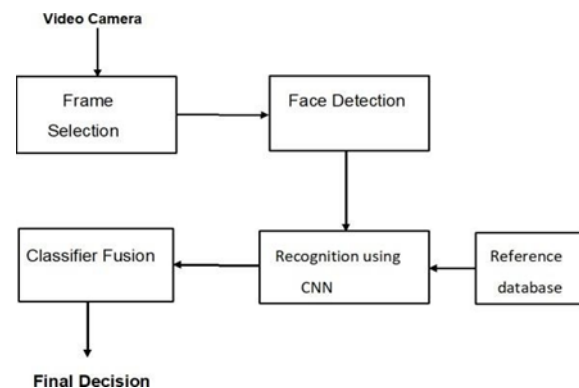


Fig.2. Proposed Architecture

## IV. CONCLUSION

Using this prototype, deep learning and convolutional neural networks will be used to reliably determine a person's gender and age range from a single facial photograph in the future. The image can be from a specific dataset or a live image, analyzed in a specific way by the prototype, or even real-time if no arguments are processed.

Projected gender is binary, and will be classified as male or female, and projected age will fall into one of the following categories: (0-2), (4-6), (8-12), (15-20), (21-24), (25-32), (38-43), (48-53), (60-100). (8 nodes in the final softmax layer) In light of factors such as the use of cosmetics, lighting, restraints, and external appearance, it is extremely difficult to determine the actual age from an image. As a result, instead of being thought of as a regression problem, it is treated as a classification challenge. Additionally, the program will analyze more photos to estimate age and gender. More tests will be done to get the exact gender and age in real-time images.

As discussed earlier in the project, this algorithm will be highly beneficial for industries with large employee populations, surveillance companies that need to track who is entering, and the government sector, where security forces can use the algorithm to track down a suspect or someone.

## REFERENCES

- [1]. Aryan Saxena; Prabhagad Singh; Shailendra Narayan Singh, Gender and Age detection using Deep Learning, IEEE, 2021.
- [2]. Amit Dhomne, Ranjit Kumar, Vijay Bhan, Gender Recognition Through Face Using Deep Learning, ICCIDS ,2018.
- [3]. Rohit Kumar Gupta, Shivaprasad M B, Dr. S. Srividhya, Age & Gender Detection using Convolutional Neural Network, IJERT,2022.
- [4]. Gil Levi, Tal Hassner, Age and Gender Classification using Convolutional Neural Networks, Department of Mathematics and Computer Science the Open University of Israel,2015.
- [5]. Koichi Ito, Hiroya Kawai, Takehisa Okano and Takafumi Aoki, Age and Gender Prediction from Face Images Using Convolutional Neural Network, APSIPA, 2018.
- [6]. Insha Rafique, Awais Hamid, Sheraz Naseer, Muhammad Asad, Muhammad Awais, Talha Yasir, Age and Gender Prediction using Deep Convolutional Neural Networks, ICIC, 2019.
- [7]. Veena N V, Chippy Maria Antony, Age and Gender Recognition Using Deep Learning, IJCRT, 2022.
- [8]. Anto A Micheala, R Shankarb, Automatic Age and Gender Estimation using Deep Learning and Extreme Learning Machine, Turkish Journal of Computer and Mathematics Education, 2021.
- [9]. Balavan Chauhan, Vivek Ravi Rangarej, Sandeep Hunnu Rathod, Mr. H R Ravikumar, Age and Gender Detection using Deep Learning, IRJET, 2021.
- [10]. Vikas Sheoran , Shreyansh Joshi and Tanisha R. Bhayani , Age and Gender Prediction using Deep CNNs and Transfer Learning, Birla Institute of Technology & Science, Pilani.
- [11]. Antipov. G. Baccouche, M., Berrani, S.A. & Dugelay, J.L. (2017) Effective Training of Convolutional Neural Networks for Face-based age and gender detection.
- [12]. Ito, K., Kawai, H., Okano, T., And Aoki, T. (2018), Age and Gender Prediction from Face Images Using Convolutional Neural Network.
- [13]. Aryan Saxena, Prabhagad singh, shailendra Narayan Singh, Gender and Age detection using Deep Learning.
- [14]. Mohd Rafey, Gurubasava, Age and Gender Detection using Python.