

**----- AGE AND GENDER PREDICTION WEBSITE -----**

## INNOVATIVE/ MULTI-DISCIPLINARY

## PROJECT REPORT

***Submitted by***

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**ABSTRACT**

Age and gender predictions of unfiltered faces classify unconstrained real-world facial images into predefined age and gender. Significant improvements have been made in this research area due to its usefulness in intelligent real-world applications. However, the traditional methods on the unfiltered benchmarks show their incompetency to handle large degrees of variations in those unconstrained images. More recently, Convolutional Neural Networks (CNNs) based methods have been extensively used for classification tasks due to their excellent performance in facial analysis. In this work, we proposed a CNN approach, to achieve robust age group and gender classification of unfiltered real-world faces. Computer Vision is the field of study that enables computers to see and identify digital images and videos as a human would. The challenges it faces largely follow from the limited understanding biological vision. A fast and efficient gender and age estimation system based on facial images is developed. There are many methods have been proposed in the literature for the age estimation and gender classification. However, all of them have still disadvantage such as not complete reflection about face structure, face texture. This technique applies to both face alignment and recognition and significantly improves three aspects Within a given database, all weight vectors of the persons within the same age group are averaged together. A range of an age estimation result is 15 to 70 years old, and divided into 13 classes with 5 years old range. Experimental results show that better gender classification and age estimation. 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.

**INTRODUCTION**

Age and gender, two of the key facial attributes, play a very foundational role in social interactions, making age and gender estimation from a single face image an important task in intelligent applications, such as access control, human-computer interaction, law enforcement, marketing intelligence and visual surveillance, etc. The enhancing of raw images that are received from the camera sources, from satellites, aircrafts and the pictures captured in day-to-day lives is called image processing. The images have been processed through many different techniques and calculations have been made on the basis and analysis of the studies.

There is a need of analysing and studying the digitally formed images. There are two main and very common steps followed for image processing. The improvement of an image such that the resulted image is of greater quality and can be used by other programs, is called image enhancement. The other technique is the most sought After technique used for extraction of information from an image. There is a division of the image into certain number of parts or objects so that the problem is solved. This process is called segmentation. A neural network consists of many simple and similar compressing elements. It is a system with inputs and outputs. There are a number of internal parameters called weights. An artificial neural network is made of set of processing elements which are also known as neurons or nodes. These nodes are interconnected. Training in ANN is done through the track of the examples. There are various such methods that fail to produce appropriate results.

For each class, an essential rule called the characteristic rule is generated. This set of rules is also called as differentiating rules. A systematic method which is used to train multilayer artificial neural networks is known as back propagation. It is also considered as a gradient method where the gradient of the error is evaluated by considering the weights of the given inputs. The detection of the data available in the images is very important. The data that the image contains is to be changed and modified for the detection purposes. There are various types of techniques involved for detection as well as the removal of the problem. In a Facial detection technique: The expressions that the faces contain hold a lot of information. Whenever a person interacts with the other person, there is an involvement of a lot of expressions. The changing of expressions helps in calculating certain parameters. Age estimation is a multi-class problem in which the years are classified into classes. People with different ages have different facials, so it is difficult to gather the images. Various age detection methods are used. The pre processing is applied to the image.

Features are the extracted from the neural network through the convolution network. Based on the trained models the image is then classified to one of the age classes. Features are extracted from the images for further processing. The features are processed further and sent to the training systems. The databases provide a study to the features and help in completing the face detection for proving the age detection of the person in the image. Age and gender assume essential parts in social between activities.

Dialects hold distinctive greetings and grammar rules for men or women, and frequently diverse vocabularies are utilized while tending to senior citizens compared to youngsters. In spite of the essential parts these characteristics play in our everyday lives, the capacity to consequently assess them precisely and dependably from face image is still a long way from addressing the requirements of business applications. This is especially puzzling while considering late claims to super-human capacities in the related errand of face recognition. Past ways to deal with assessing or ordering these properties from face images have depended on contrasts in facial feature dimensions or "customized" face descriptors. Most have utilized characterization plans composed especially for age or gender orientation estimation undertakings, including and others.

Few of these past strategies were intended to handle the numerous difficulties of unconstrained imaging conditions .In addition, the machine learning strategies utilized by these frameworks did not completely abuse the huge quantities of image cases and information accessible through the Internet keeping in mind the end goal to enhance characterization capacities.In this paper we endeavour to close the gap between automatic face recognition abilities and those of age and gender classification techniques. To this end, we take after the fruitful sample set around late face recognition frameworks: Face recognition systems portrayed in the most recent couple of years have demonstrated that gigantic advancement can be made by the utilization of profound convolutional neural networks (CNN).

We show comparative additions with basic system engineering, composed by considering the somewhat constrained accessibility of precise age and gender classification names in existing face information sets.

**OBJECTIVES**

**Age and gender prediction**’ is a deep learning project based on computer visioning. Through this Project, we can learn the practical application of CNN i.e, the **convolutional neural networks.**

It’s a very practical project as we have created a model that can detect any human being’s age & gender through analyses of single face detection via an image. So, with this gender classification in a man or a woman can be classified.

Our solution is able to classify images in different lighting conditions and different illumination conditions and predict the exact age and gender.

**METHODOLOGY**

There are 4 modules in our project. They are

1. Uploading Image in the Website
2. Face Detection and pre processing
3. Feature Extraction and Classification
4. Age and Gender Prediction

**MODULE 1: UPLOADING IMAGE IN THE WEBSITE**

* Input image is the image intended to test with the age and gender classifier.
* User can input any type of image format like .jpg, .png, .tiff, and .bmp.

**MODULE 2: FACE DETECTION & PRE PROCESSING**

* First phase will proceed to check whether the given input image contains a face image or not.

* Algorithms will print no face detected if there was not any face area in the given input image.
* If facial images are detected, the classifier will identify the face areas from the images and create a separate image per every face in the input image.
* Classifier has been trained with a sufficient number of frontal, nearly frontal, rotated faces from 0 to 45 degrees and non face images.
* Detected face images are pre-processed to standardize the face images by converting them to image format.
* Images used in the experiment are in different conditions such as presence of noisy data, different lighting conditions and different intensity levels.
* Thus, detected face images need to undergo a preprocessing step before forwarding to the classification stage for predicting gender and age.

**MODULE 3: FEATURE EXTRACTION & CLASSIFICATION**

The two-level CNN architecture includes feature extraction and classification itself.

* The feature extraction extracts feature corresponding to age and gender , while the classification classifies the face images to the correct age group and gender.
* Particularly, we address the large variations in the unfiltered real-world faces with a robust image preprocessing algorithm that prepares and processes those faces before being fed into the CNN model.
* Classification is done using Artificial Neural Networks according to the different shape and texture variations of wrinkles on face images. The system can categorize and diagnose text sources automatically with a sensitivity and specificity of age and gender with unknown testing data.

**MODULE 4: AGE AND GENDER PREDICTION**

* We will load the gender weight file and model file into the network.
* After that gender will be predicted for the respective image
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* After that age will be predicted for the respective image

**WORK PLAN**

