Age and Gender Detection using Deep Learning

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ABSTRACT - *Automatic age and gender classification has become more useful as there is increase in number of applications, especially since the increase of use in online platforms and social media. In spite of that, execution of actual software technique on real-world images is still not so accurate due to lacking in upgradation, especially when compared to uses in recent covid-19 pandemic for face recognition and other tasks. In this paper we show that learning face recognition through deep learning and convolution neural network(CNN), a gradual increase in performance can be obtained on these tasks.*

Key word - *convolution neural network(CNN).*

1. INTRODUCTION

Age Recognition model may be used for categorization data in companies collecting information about people (such as model or recruiting agencies), for forming selection of respondents during social science researches, for verification users of dating services, social media and other services which require confirmation of age. A new study by the NIST revealed dramatic biases in the facial recognition software when it came to identifying the people of color. According to the study which they made says, there was increase in false positives when the study ware made between two people where one was from Asian and another one was from African American, this people face ware compared with Caucasian faces. And this effect was exceptionally dramatic as in some case as there was misidentifications 100 times more for the people who are actually from Asian and African American compared to the people who are white in skin color.

It also says that the facial recognition software and algorithm developed in Asian countries are less likely to misidentify people of color. This clearly shows that there is effect of the diversity of existing data, or scarcity, on the resulting method.

2. Literature Survey

Yunjo Lee (2011), proposed a methodology, that the fMRI method is one of the efficient way to analyses and determine the age of the people around us. The study includes recording of different aged people according to there gender, height and other characteristics. The brain activation tasks which are related to face matching are performed and tested outside the scanner. After analyzing all data there was no change in existing result in face processing in older as well as young adults. The result remain same in the people who are having same face viewpoints. The aging of the people who

are higher in age ware not based on single factor. It is combination of various constituent which are taken by gathering all the data that result in contributing some genuine reason to such results. The results which we get at end should be analyzed by comparing all required credentials so that it can be used in certain environment.

R. Begg (2006) proposed a methodology, that the aging through the artificial neural networks will change the walking by using automatic recognition is the aim of the article. The balance control of the locomotors system will get disturbed due to the manner of walking which are caused through patterns which are generated according to the increasing age. There are many good reasons to use such techniques. The first one was standard back propagation and second one was scaled conjugate gradient and last one was back propagation with the help of Bayesian regularization ware three methods used. The three networks came out with improved results but from above all methods Bayesian regularization method was the one of the better methods which gave greater result in some of the fields. The neural networks thus are a one of the best method to find age identification process.

Hang Qi (2009) proposed a methodology, that various techniques coming into force for detection of face which can be further used to get age of the required person. Here, an (AS) which is also called as automated system has been suggested which can classify the age and help differentiate kids face from that of adults and elders one face. There are three steps which are used in this method. First one is detection where the input is persons face and second one is face alignment which is used to find the geometrical structure of human faces and third one is normalization. Face samples are taken from normal face detection and alignment method. ICA is used to extract basic facial components from the inputted faces. This system is better and faster. Results which are gathered from this process are efficient.

Kensuke Mitsukura (2003) proposed a methodology, that by analyzing the color information the threshold value In multi-valued images is considered. There is lack of information when there is no major changes in threshold of an image. Whenever there is external influence of any light vary, the data of the color varies. It becomes important to decide the face. It is not easy to determine the face division standards. This is done to provide the required information to the genetic Algorithm used in the method. Face decision method is suggested further which can be used to determine whether

the specified face is correct or not. The individual face identification is especially important. In this color map is used to differentiate the detected faces.

Chao Yin (2012) proposed a methodology, the method consist of CPNN which is also called as Conditional Probability Neural Network is a distribution learning algorithm used to estimate age using facial expressions. It consists of three major neural network system in which the value of the target and the conditional features vectors are used as there input values. This also help in finding real age of the people. The relation between the related distribution through neural network and face image is used as the understanding method for this system. The method which was used earlier suggested that the relationship is to be used according to the maximum entropy model Conditional Probability Neural Network proved to be providing best accuracy result then that of previous methods. As the results are very efficient and easy, there was less steps involved and the outcomes are very efficient. Due to all such good reasons it was one of the best suggested more than other methods.

Sarah N. Kohail (2012) proposed a methodology, that one of the main challenge faced in present time is to detect age of the specific people. The article suggest approach of neural network to estimate the age of the specific human. The main change which has been suggested in this article is about fine tuning of the age ranges. To learn Multi-layer perception neural networks(MLP) the facial characteristics of the new images were taken out and recorded. The inputs were added to the layer. The results have shown multi-layer perception method as a most efficient method with minimum error in the results. The output result can be used in many applications for example like age-based access control application and also like age adaptive human machine interaction. Higher standards features to be added in the system, where input conditions can be reduced and system can be made more automatic to reduce number of steps and make it more efficient.

A. Kumar and F. Shaik (2016), elaborated about image processing and they also said that there are two very important principals application areas which are important for the improvement of digital processing of the images. The first one is to improve the pictorial information for human interpretation and second one is to process the scene data for an autonomous machine perception. Importance of digital image is vastly used in many fields such as remote sensing, images and data storage for transmission of business application, in cash withdrawal block, medical imaging, banks, populated malls, traffic mobility of people, acoustic imaging, images which are captured by the satellites are useful to find the resource around us or at particular place, geographical mapping, and in urban population. Image processing is also used in space image application to process the objects which are captured in space, there are also used in medical application such as x-rays and MRI(Magnetic Resonance Imaging).

Yunjo Lee, Cheryl L. Grady, Claudine Habak, Hugh R. Wilson, and Morris Moscovitch(2011), proposed a methodology, it says that some features of neural which shows same similarities during facial processing may change by using FMRI and behavioral change paradigm. In the scanner, participants ware back-to-back presented with faces that varied in pose, viewpoint, both or neither and executed a measurement of head size irrespective of pose or viewpoint. In right fusiform face area (FFA). Adults having higher age failed to execute adaption to the same face which where shown again and again with same views, but in young adult they showed the changes foe same view. They also executed a different analysis to examine the relations which are similar between whole-brain activation pattern and adaption in a face matching process, which ware taken outside the scanner, Even having poor neural adaption behaviors in right FFA, high performing of aged adult engaged the similar face processing network as high performance of adults who are in lesser age across the conditions, except at one condition which consisted of showing same facial pose across different viewpoints. Low performing aged adults not used this network for more duration. Adding to that high performing aged adults differently hired a set of places which are related to better execution across all different conditions. It not consist of deep neural face processing network but it includes the left inferior, cerebral cortex, parietal area representation becomes less selective as the age of the person increases. Study suggest that ages adults utilize a distinct network of areas which are linked with best face matching performance image

3. CONCLUSION

This paper includes the literature survey on 8 papers which proposed different methods used for detection of face and age detection. We have gone through each & every method available for images processing and finally came to a conclusion about these important algorithms namely: Fuzzy C Means Clustering algorithm, K means algorithm, Object labeling algorithm, Watershed algorithm and many more. Mainly used classifiers were Support Vector Machine (SVM), and Convolutional Neural Network (CNN). It was found that the classifier implemented using the CNN model gave higher accuracy. We are applying CNN classifier in our proposed system used to detect face and gender detection. The proposed system that we are about to implement has overcome a lot of disadvantages that were faced in similar methods & in few of the methodologies above, it provides the most optimal accuracy for the segmentation of the images.

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