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Survey Report on

AGE AND GENDER DETECTION USING DEEP LEARNING

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SURVEY REPORT

AGE AND GENDER DETECTION USING DEEP LEARNING

TITLE:

AGE AND GENDER DETECTION **ABSTRACT:**

A Human face shows various emotions, expressions, and many more. Here we are going to determine the age of a human person through his/her face. This age estimation from the face is a challenging problem because of many internal factors, such as gender and race, and external factors, such as environments and lifestyles. Here we are going to build a gender and age detector that can guess the gender and age of the person(face) in real-time using a webcam by Deep learning methodologies like CNN and Open-CV.

Automatic prediction of age and gender from face images has drawn a lot of attention recently, due it is wide applications in various facial analysis problems. However, due to the large intra-class variation of face images (such as variation in lighting, pose, scale, occlusion), the existing models are still behind the desired accuracy level, which is necessary for the use of these models in real-world applications. In this work, we propose a deep learning framework, based on the ensemble of attentional and residual convolutional networks, to predict gender and age group of facial images with high accuracy rate.

Using attention mechanism enables our model to focus on the important and informative parts of the face, which can help it to make a more accurate prediction. We train our model in a multi-task learning fashion, and augment the feature embedding of the age classifier, with the predicted gender, and show that doing so can further increase the accuracy of age prediction. Our model is trained on a popular face age and gender dataset, and achieved promising results.Through visualization of the attention maps of the train model, we show that our model has learned to become sensitive to the right regions of the face.

In this project, we are going to use Deep Learning to accurately identify the gender and age of a person from the image of a face. The predicted gender may be one of 'Male' and 'female' and the predicted age is in the range of $(0 – 2)$, $(4 – 6)$, $(8 – 12)$, $(15 – 20)$, $(25 – 32)$, $(38 – 43)$, $(48 – 53)$, $(60 – 100)$. Here we will use the Adience dataset, It has a total of 26,580 photos of 2,284 subjects in eight age ranges as Mentioned above. It is difficult to accurately guess an exact age from a single image because of factors like makeup, lightning, obstructions, and facial expression.

INTRODUCTION

Age and gender information are especially important for various real-world applications, such as social understanding, biometrics, identity verification, video surveillance, human computer interaction, electronic customer, crowd behavior analysis, online advertisement, item recommendation, and many more. Despite their huge applications, being able to automatically predicting age and gender from face images is an extremely hard problem, due to the various sources of intra-class variations on the facial images of people, which makes the use of these models in real world applications limited.

There are numerous works proposed for age and gender prediction in the past several years. The earlier works were based on hand-crafted features extracted facial images followed by a classifier. But with the remarkable success of deep learning models in various computer vision problems in the past decade [1]– [5], the more recent works on age and gender predictions are mostly shifted toward deep neural networks-based models.

In this work, we propose a deep learning framework to jointly predict the age and gender from face images. Given the intuition that some local regions of the face have more clear signals about the age and gender of an individual (such as beard and mustache for male, and wrinkles around eyes and mouth for age), we use an attentional convolutional network as one of our backbone models, to better attend to the salient and informative part of the face. Figure 1 provide three sample images, and the corresponding attention map outputs of two different layers of our model for these images.

As we can see, the model outputs are mostly sensitive to the edge patterns around facial parts, as well as wrinkles, which are important for age and gender prediction. As predicting age and gender from faces are very related, we use a single model with multi-task learning approach to jointly predict both gender and age bucket. Also, given that knowing the gender of someone, we can better estimate her/his age, we augment the feature of the age-prediction branch with the predicted gender output.

Through experimental results, we show that adding the predicted gender information to the age prediction branch, improves the model performance. To further improve the prediction

accuracy of our model, we combine the prediction of attentional network with the residual network, and use their ensemble model as the final predictor.

LITERATURE REVIEW

Age and gender detection is overly exciting process in which researchers are excited.

There are more scientists who decide to examine this area. Some of the scientists included in this area are:

In 1999 kwon and lobo developed the very first method for age estimation focusing on geometric features of the face that determine the ratios among different dimensions of facial features.

Dileep and Danti also proposed an approach that used feed forward Propagation neural networks and 3 - sigma control limits approach to classify People age into children, middle aged adults, and old aged adults.

LITERATURE SURVEY SUMMARY

Sr.no	Title of the Paper	Author	Publication	Technique Used
01	Age and Gender Estimation of Unfiltered Faces	Eran Eidinger, Roee	IEEE TRANSACTION DEC. 2014	Robust face alignment technique, SVM
02	Automated Estimation of Human Age, Gender, and Expression	Yaoyu Tao	Stanford, CA 94305, USA taoyaoyu@stanford.edu	LBP & Gabor filter LDA algorithm
03	Comparison of Recent Machine Learning Techniques for Gender Recognition from Facial Images	Joseph Lemley Sami Abdul-Wahid Dipayan Banik	Central Washington University Ellensburg, WA, USA MAICS 2016	Feature extraction techniques: PCA & HOG, Gender classification methods
04	Partial Face Recognition: Alignment-Free Approach	Shengcai Liao, Anil K. Jain, Fellow, IEEE, and Stan Z. Li	IEEE transactions on pattern analysis	PCA + LDA & LBP Canny edge detector
05	Age Group Estimation using Face Features	Ranjan Jana, Debaleena Datta, Rituparna	(IJEIT) Volume 3, Issue 2, August 2013	K-means clustering algorithm. PCA, LDA.
06	Gender Recognition and Age-group Prediction: A Survey	Mr. Brajesh Patel. Mr. Raghvendra	ISSN:2319-7242 Volume 3 Dec.2014	Algorithm: SVM Adab Oost
07	Face Recognition G on Improved SIFT Algorithm	Ehsan sadeghipo Nasrollah sahragard	(IJACSA) Vol. 7, No. 1, 2016	Improved SIFT descriptor using Gabor

EXPERIMENTAL RESULTS AND DISCUSSION
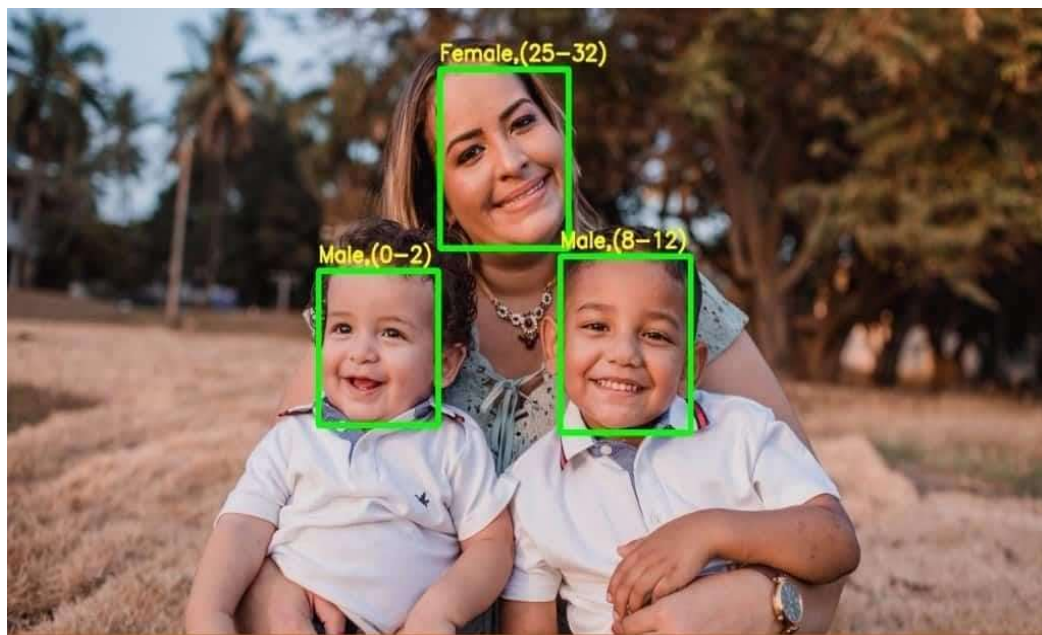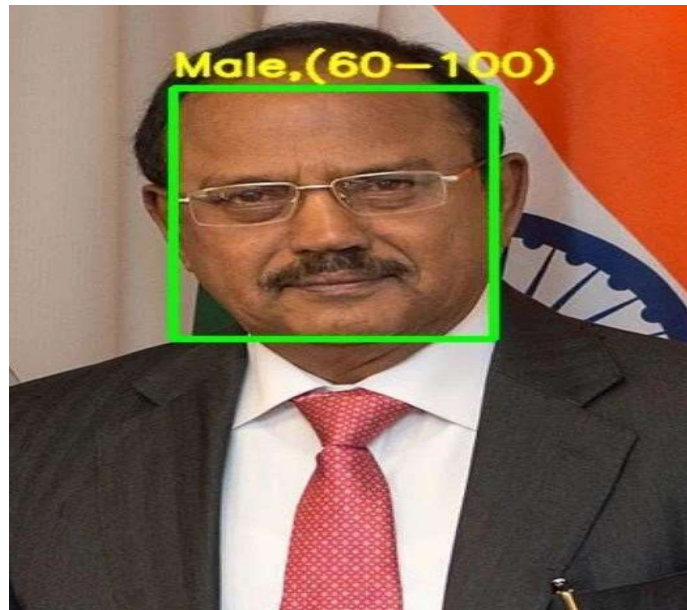
Age and gender detection is a deep learning-based model the main concept of the deep learning used in this project is to get the accurate results. The age and gender detection are one of the promising research projects. To implement this project some of the technologies are used those are the Convolutional neural Networks (CNN) for extracting the features from an input image and the other is one of the python libraries called the OpenCV which can process an image. And,

dataset is used I.e., Adient dataset which Is trained with some images along with age and gender features.

CONCLUSION

Human Age and gender classification" are two of the many valuable information gathering resource from and individual. Human faces provide enough data which may be used for many purposes. To reach the correct audience human age and gender classification is very essential.

Here we tried to do the same process but with general equipment. The efficiency of the algorithm depends on several factor but the main motif of this project is being easy and faster while also being as accurate as possible. Work is being done to the improve the efficiency of the algorithm. Some future improvements include discarding the face like non-human objects, more datasets for people belonging to different ethnic groups and more granular control over the workflow of the algorithm.

The task of recognizing age and gender, nonetheless, is an innately troublesome issue, more so than numerous other PC vision undertakings. The fundamental justification for this trouble hole lies in the information needed to prepare these kinds of frameworks. While general article discovery errands can regularly approach many thousands or even large numbers of pictures for preparing, datasets with age and gender names are extensively more modest, as a rule in the large numbers or, best case scenario, several thousand.

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