AGE AND GENDER PREDICTION USING MACHINE LEARNING

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ABSTRACT: Because of its wide range of applications in a variety of facial investigations, automatic age and gender prediction from face photos has recently gained a lot of attention. Automatic age and gender prediction from face images has lately attracted much attention due to its wide range of applications in numerous facial analyses. We show in this study that utilizing the Caffe Model Architecture of Deep Learning Frame Work; we were able to greatly enhance age and gender recognition by learning representations using deepconvolutional neural networks (CNN). We propose a much simpler convolutional net architecture that can be employed even if no learning data is available. In a recent study presenting a potential benchmark for age and gender estimation, we show that our strategy greatly outperforms existing state-of-the-art methods.

Keywords: Age, Gender, Detection, Features, Extraction, Data Visualization, Classify, CNN, proposed framework, Training data.

OBJECTIVES • To recognize Human's face contains features that can be helpful in determining the identity, ethnicity, gender, age and emotions of people. We propose a multi-task learning framework to jointly predict the age and gender of individuals from their face images

. • To develop an ensemble of attention and residual networks, which outperforms both individual models. The attention layers of our model learn to focus on the most important and salient parts of the face.

• We further propose to feed the predicted gender label to the age prediction branch, and show that doing this will improve the accuracy of age prediction branch.

• With the help of the attention mechanism, we can explain the predictions of the classifiers after they are trained, by locating the salient facial regions they are focusing on each image

INTRODUCTION:

Age ,gender, two of the key facial attributes, play a very foundational role in social interactions, making age and gender estimation from a single face frame is an important task in intelligent applications, such as access control, human-computer interaction, law enforcement, marketing intelligence and visual surveillance, etc. In this project, a frame is taken as input and the algorithm will determine the age and gender of person(s) in the frame. We divide the age into 8 ranges[(0 – 2), (4 – 6), (8 – 12), (15 – 20), (25 – 32), (38 – 43), (48 – 53), (60 – 100)] and the output age will fall into one of them. While, the gender will be either male or female.Biometric authentication, which identifies a person using physiological or behavioral characteristics, has attracted much attention because of providing better security and more convenience than conventional approaches such as key, password and number. Conventional approaches such as key, password and number . Various biometric traits such as face, fingerprint, iris, signature, voice and gait can be used in person authentication. Among them, face recognition is the hottest research topic in biometrics and is in a huge demand, since person authentication using face is a natural way of human beings. Traits used in soft biometrics are, for example, gender, age, ethnicity, hairstyle, hair color, accessory, etc. These are not always useful in person authentication, while a set of them can be complementarily used with general biometric recognition and can be taken under various condition of data acquisition compared with general biometric traits. Therefore, the combined use of face recognition and soft biometrics makes it possible to improve the recognition accuracy of face recognition

TECHNOLOGY USED

1.Open CV: Open CV is Open Source Computer vision. This library is capable of processing real-time frame and video while also boasting analytical capabilities. OpenCV is used to display text on the picture using putText(). Imshow() is used for the frame output. The

cv2.dnn.blobFromframe function returns a blob which is our input frame after mean subtraction, normalizing, and channel swapping.. Features of OpenCV Library : MEAN SUBTRACTION USING blobFromImage() OF OpenCV Using OpenCV library, you can − •Read and write frames •Capture and save videos •Process frames (filter, transform) •Perform feature detection •Detect specific objects such as faces, eyes, cars, in the videos or frames. •Analyze the video, i.e., estimate the motion in it, subtract the background, and track objects in it. OpenCV was originally developed in C++. In addition to it, Python and Java bindings were provided. OpenCV runs on various Operating Systems such as windows, Linux, OSx, FreeBSD, Net BSD, Open BSD, etc.

2.CONVOLUTION NEURAL NETWORK(CNN):

A Convolutional Neural Network is a deep neural network (DNN) widely used for the purposes of frame recognition and processing and NLP. Also known as a ConvNet, a CNN has input and output layers, and multiple hidden layers, many of which are convolutional. In a way, CNNs are regularized multilayer perceptrons. The convolutional neural network for this python project has 3 convolutional layers: Convolutional layer; 96 nodes, kernel size 7 Convolutional layer; 256 nodes, kernel size 5 Convolutional layer; 384 nodes, kernel size 3 It has 2 fully connected layers, each with 512 nodes, and a final output layer of softmax type.

3.TENSOR FLOW:

TENSOR FLOW is an end-to-end open source platform for machine learning. TensorFlow is a rich system for managing all aspects of a machine learning system. . TensorFlow allows developers to create dataflow graphs—structures that describe how data moves through a graph, or a series of processing nodes. Each node in the graph represents a mathematical operation, and each connection or edge between nodes is a multidimensional data array, or tensor. The single biggest benefit TensorFlow provides for machine learning development is abstraction. Instead of dealing with the nitty-gritty details of implementing algorithms, or figuring out proper ways to hitch the output of one function to the input of another, the developer can focus on the overall logic of the application. TensorFlow takes care of the details behind the scenes. For face detection, we have a .pb file- this is a protobuf file (protocol buffer); it holds the graph definition and the trained weights of the model. We can use this to run the trained model. And while a .pb

file holds the protobuf in binary format, one with the .pbtxt extension holds it in text format. These are TensorFlow files.

4.DEEP LEARNING:

Deep learning is an artificial intelligence (AI) technique that seeks to learn from experience to resemble the human brain. Through a training procedure, these representations are learned. To teach the software how to detect an object, we must first train it with a large number of object images that we categorise according to different classes. Deep learning-based algorithms, on average, require a large amount of training data and take longer to train than traditional machine learning methods. Finding unique attributes when trying to recognise any object or character on an image is time-consuming and complex. Unlike traditional machine learning, where features are manually retrieved, problems can be solved using deep learning approaches, which extract important characteristics from data automatically. A neural network with multiple hidden layers is known as deep learning. They may build complicated notions from simple concepts after an image has been taught over the network

IMPLEMENTATION:

Convolutional neural network CNN is one of the main algorithms for deep learning in which it can learn to do classification tasks directly from images. This algorithm will be very useful in our case by assuming the gender and the age range prediction as a classification problem with two classes Male and Female for gender and multiple classesfor the age ranges. The main goal of this paper is an attempt to propose a form validation role that can be linking between gender, DOB, and user photo inputs and validate each of them based on their relationship. Gender and Age Classification using CNNs
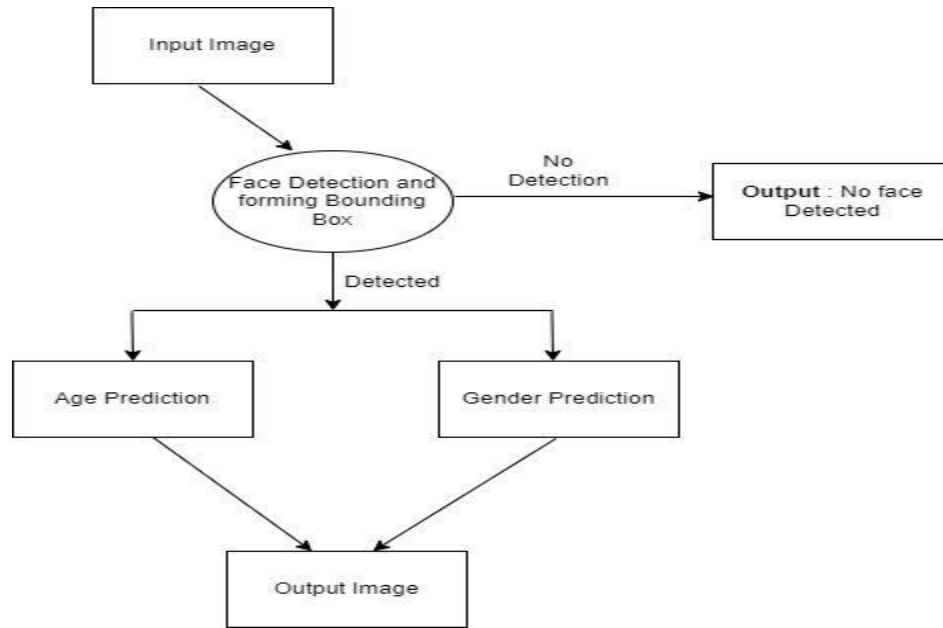
Fig No.1 Implementation

APPLICATIONS:

Quividi is an AI software application which is used to detect age and gender of users who passes by based on online face analyses and automatically starts playing advertisements based on the targeted audience.

• Human gender and age recognition is an emerging application for intelligent video analysis.

• In the forensic field, where often only the description of a suspect is available, usually the data that is always available are the gender and an age range, which would be very useful in reducing the list of candidates to be compared with the sketch to get the answers to be more precise.

CONCLUSION:

Although age and gender classification concerns were addressed by earlier systems, much of this research was previously restricted to constrained photos taken in lab settings. The visual discrepancies that are common in real-world photos on social media platforms and in online archives are not sufficiently reflected by such settings. On the other hand, it is more difficult to find photographs online because there are so many more of them. We examine Deep-performance CNNs on these tasks using Internet data and a related field's example of facial

recognition. We present our results utilizing a lean Deep Learning architecture that avoids overfitting due to the absence of labeled data.

FUTURE SCOPE:

Some future improvements can be made to this project. To improve the accuracy, a dataset with more number of images can be given. ϖ The algorithm can be improved to an extent where it can be able to process and give the desired result on images with disturbances like lack of clarity, a different angle, or any kind of accessories on the face. For example, if the person is wearing sunglasses, or has makeup on the face, the algorithm will be able to give the desired results.

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