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Age Analysis using Face Recognition with Hybrid Algorithm

Rajaneedi Sai krishna[1], Chinta Susmitha Roy[2], A. Thamarai Selvi[3]

[1,2]Student, Computer Science and Engineering, Hindustan Institute of Technology and Science, Tamilnadu, India
[3]Assistant Professor, Department of Computer Science and Engineering, Hindustan Institute of Technology and Science, Tamilnadu, India

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Abstract - Age estimation of face strives to predict the exact age for the given face images, which plays a major role in human computer interaction. And it also used in many applications like face recognition and age estimation. Present applications are not accurate, they achieved low level of accuracy. To estimate accurate age of a face image, many existing algorithms require a huge labelled data set of face images. This system gives no age label, so it is simple to know the age difference between a pair of images the same person. Each and every image is labelled with a people identity and year when the image is taken. All the images are refined with pixel rate, face recognition, alignment and algorithms which guarantees the reliability of the dataset. For the non-age-labelled face images, here combines the images of the same person into pairs and extracts the difference of taken years and difference of age. By refining the weakly labelled data with a novel learning scheme using deep Convolutional Neural Networks, successfully achieves the accuracy of age prediction.

Keywords – Image Recognition, Convolutional Neural networks, Age Detection.

1. INTROUDUCTION

Age is one of the key attributes used by marketing, entertainment and security tools. Age information can be applied in many other sectors such as law enforcement, human-control interaction and social media. Every human is equipped with the ability of estimating the age of someone with a simple face glint. Due to existence of non-verbal characteristics, humans are well accomplished on biological traits such as gender and ethnicity classification, health status diagnostic and facial expression interpretation, which are possibly detecting tasks.

These innate human capabilities are essential in our integral part of social interactions. However, even humans can be easily fooled by other non-natural factors such as makeup, skin tan, both hair facial style, plastic surgery, among many others. The present stage of the art on face identification has become sufficient for it to enter mainstream products. The problem of unique verification and identification are actively growing in an area of research. Face images are gently using additional validation in most of the applications for the high security. For example, currently, the market of mobile phones switching from fingerprint identification to face identification as the preferred method for unlocking a secure device. Usage of computers and image processing technology is to analyse facial images accurately to predict a person's age. Generally, humans can easily estimate other person age and identity by their postures and gestures of the face.

In this paper, successful age group analysis of using face features like texture, shape and other from the human face images are proposed. For best performance, the geometric features of face angles, left eye, right eye, eye brows, nose, chin, cheeks, lips and many more are calculated. In this paper, collected real time images are differentiated as per the age group.

The algorithms like Support Vector Machine (SVM) classifier & Local Binary Pattern (LBP) are used for age classification. In this proposed system, 1. Representing face images and 2. Age estimation these are the two main issues in age analysis. The classifier is to learn the modern age estimation functions and learning methods which are considered as of classification or regression problems. The classification method takes the age value as a separate category and then learns a classifier for age classification. There are number of standard classification methods can be used to perform accurate age prediction.

The regression method fits the mapping the features mainly age by regularization method to get the perfect regression function. The inner link is ignored and maverick age species are regarded by classification method. Moreover, people are in a different age growth can have a different age, most of the people are aging earlier than the actual age that is called "Premature Aging" that can divide the training data according to the age and use of different models to predict the age with an age difference by the face images. Finally, all these boundaries are loaded to resolve the difficulty of classification partiality provoked by the disparity of typical number, where that improves the age analysis accuracy rate further.

2. RELATED WORK

A. Motivation of the work:

To estimate how many people, fall into certain age group which can help the public organizations to take up welfare programs. It is also used in forensic collection of long-term unsolved cases and seeking for the lost children and split up families, face recognition is the strongest process in age analysing.

B. Objective of the work:

Face attributes are one of the crucial unique properties. Face attributes are used in many applications like face recognition and age prediction. In order to predict an accurate age of a face image, many existing algorithms require a huge labelled data set of face images. Proposed system provides no age label, so it is simple to predict the age difference with an image pair of the same person. By refining the weakly labelled data with a novel learning scheme using deep Convolutional Neural Networks, successfully achieves the accuracy of age prediction.

C. Existing System:

In current years, the curiosity in human face age estimation has significantly increased the existing systems of age estimation generally consists of two modules

1. Extracting the facial features for age and

2. Learning the age with the image features.

Numerous facial age features have been developed for facial age prediction. Biologically inspired features (BIF) proposed by 'Guo et al' is one of them. With the acquired image features for the age estimation, several methods have been proposed to learn age estimation.

D. Proposed System:

In present days, people are very passionate about taking their pics or images that initiate an approach to predict the age of a human face with the support of age difference and the identities information. Each and every image is labelled with people identity and the image taken year. Every image is refined with face recognition, alignments and algorithms which guarantees the reliability of the dataset. Taken a multiple image of the individual persons at different years, then the proposed system explores the age difference of the images using Convolutional Neural Networks. In the modules, the proposed system learns age prediction based on the labelled age datasets. For the non-labelled images, it combines the multiple images of the individuals and acquires the age difference from the taken years and predicts the age of a person. In the multiple images of an individual the proposed system learns with the haar features of the person with an algorithm and methodology.

3. LITERATURE SURVEY

Analysing the Age:

Face detection and the classification of the face attributes or face images is interesting field in research area. In this proposed paper, we present a short review about some of the existing systems in face detection and age prediction. We have executed a research on age prediction, the main objective of this project is to extract the haar features of the face and predicts the accurate age from the face images. We have come across many applications and technical papers related to the "Age Estimation". Each and every application or paper have their different vision on the age estimation and also various approaches accordingly. This paper presents an overview on papers related to the earlier proposed systems. Every human face is different from other, every person has an individual feature. Each individual can have different personality traits like colour, pattern. In this paper the intensity-based features were based on Haar features.

4. METHODOLOGY

For the automatic age analysis of face, two facial image datasets (training and testing) are used. To train the system, less labelled data of the face images are used where the images ages are known and huge non-labelled face images are used to test where the ages are unknown. The complete research work conveys an automatic age analysis technique that uses Convolutional Neural Networks.

Convolutional neural network (CNN) has obtained a best performance on CV and pattern recognition tasks due to its strong capability of self-learning and dealing with huge large-scale data. This mainly explores the implementations of CNN with well-performed label encoding method. To evaluate the performance of CNN and label encoding methods, two CV tasks are necessary, i.e., age analysis from face image and depth estimation from a single image, are conducted. Most of the current world, CNN-based methods have been widely acquired for age analysis due to its higher-level performance upon existing methods.

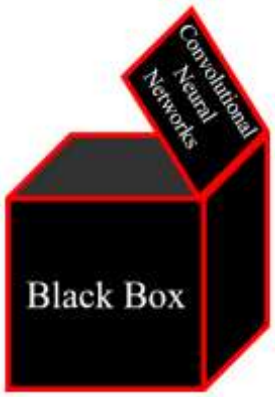

Fig: Convolutional Neural Networks Methodology

5. MODULES

A. Collecting Data from Sources

Facial Images are collected from the different or multiple sources.

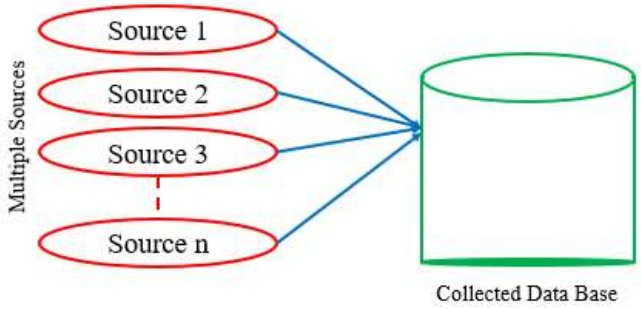

Fig No 1: Collecting Data from Sources

B. Image Resizing and Image filtering

Collected images are filtered and converted to the required pixel rate using the python code.

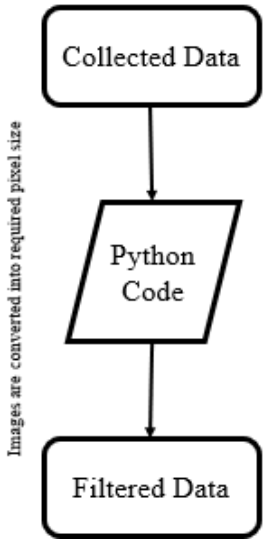

Fig No 2: Filtering Data

C. Converting image into multiple Angles

After filtering every single image is converted into a multiple angle of an image.

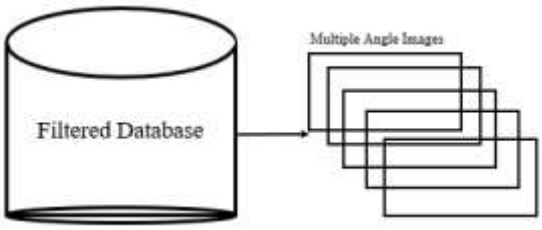

Fig No 3: Multiple Angle Images

D. Face Detection Model Training:

The created or multiple angle images are trained.

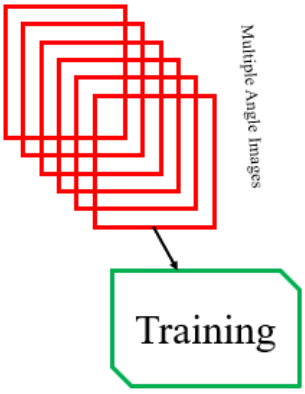

Fig No 4: Face Detection Model Training

E. Classified Model:

In the training model, Viola Jones is a model used in face recognition and it is also an algorithm is used to detect the facial features and detects the face.

Fig No 5: Classified Model

F. Convolutional Neural Networks (Black Box):

It's a black box, where all the facial features are detected and all the dimensions and pixel rate are taken by itself by learning, it learns by itself and classifies with the supportive algorithms.

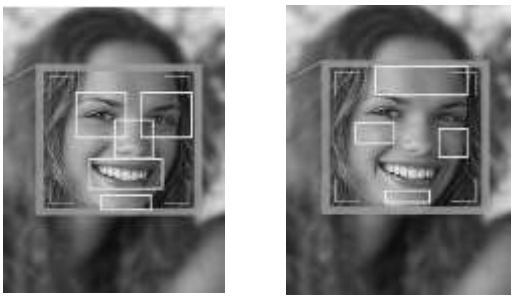

Fig No 6: Convolutional Neural Networks (Black Box)

G. Classifying Algorithms:

Using combination of multiple algorithms, the age can be classified and analysed with an accuracy

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6. RESULTS

Face images are acquired to train the system and those images are taken for the age analysis. Face attributes are used for clustering and classification of the face images with the analysed or predicted age. The evaluated results exhibit the accuracy of the prediction of age is high accurate but the time complexity will be more. From the obtained results, it is validated that, the accuracy of predicting the age is in high tolerance. The proposed system gets the accuracy rate up to 96.7%, which is acceptable.

7. CONCLUSION

Face images became most significant in recent years, that images are used for the clustering and analysis of age from facial features. The results indicate the highest detection accuracy rates. To overcome the problems of the existing systems we proposed a new hybrid algorithm which is a combination of multiple algorithms which gives a high accuracy rate. The Viola Jones is the algorithm which is used to detect the face. The CNN is the methodology which is used to train the data and to get a best performance which trains by itself. The combination of the multiple algorithms is the hybrid algorithm which classifies the age and gives the output.

8. FUTURE SCOPE

As a future project this hybrid algorithm will get compared with the deep neural networks and test results will be drawn. If this performs better then lot of time can be saved in training the deep convolutional neural networks. This can even change usage of machine learning over the datasets. It can be made as an application and to perform the high accuracy and time efficient.

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