

CHAPTER 2

LITERATURE SURVEY

1. Detection of Gender, Age and Emotion of a Human Image using Facial Features

In paper one, we get to study the recent research on FER, that allowed us to know the latest developments in this area. They have described different architectures of CNN and CNN-LSTM recently proposed by different researchers, and presented some different databases containing spontaneous images collected from the real world and others formed in laboratories, in order to have and achieve an accurate detection of human emotions. They also presented a discussion that shows the high accuracy rate obtained by researchers that is what highlights that machines today will be more capable of interpreting emotions, which implies that the interaction between human and machine becomes more and more natural. The main motive of this paper is to develop an automatic age and gender estimation method towards human faces which will continue to possess an important role in computer vision and pattern recognition. Apart from age estimation, facial emotion recognition also plays an important role in computer vision. Non-verbal communication methods such as facial expressions, eye movement and gestures are used in many applications of human computer interaction.

- a) The IMDB-WIKI dataset which is the largest dataset with real age and gender annotations.
- b) A novel regression formulation is used with deep classification followed by expected value refinement.
- c) The DEX system, which is the winner of the LAP 2015 challenge on apparent age estimation.

2. Facial emotion recognition using deep learning: review and insights

In paper two, the automatic FER task goes through different steps like: data processing, proposed model architecture and finally emotion recognition. The preprocessing is an important step, that consist several techniques such as resized and cropped images, normalization spatial and intensity pixels, and the data. Three CNN with same architecture where each one detects a part of the face such as eyebrow, eye, and mouth. Before introducing the images into CNN, they go through

the crop stage and the detection of key-point facial. The iconic face obtained combined with the raw image was introduced into second type of CNN to detect facial expression. Researchers in this field are interested in developing techniques to interpret, code facial expressions and extract these features in order to have a better prediction by computer. With the remarkable success of deep learning, the different types of architectures of this technique are exploited to achieve a better performance.

3. Age, Gender Prediction and Emotion recognition using Convolutional Neural Network

In paper three, we get to study that the major role in every person's life is emotions. Emotions reflects how a person feels and the mood we are in at different situations what we encounter in our days. So, here we can see how the neural networks take part in detection of our age, gender, and emotions. The success in CNN architecture and its capability to detect and compile is more efficient. There are many extraction techniques which helps in facial identification based on geometric, template, appearance etc. through the color using the methods like genetic algorithms technology. The convolutional layers are the most basic and important steps CNN's. Along with this the wide residual network which is the upgradation of original residual networks which helps in improving the network depth and accuracy. For each emotion and gender, A separate single layer had to be used, but here the multi-task learning comes into picture where the age and gender are estimated at once using the single CNN. IN this way, both age and gender share a set of layers which are projected as one single layer and produced as single output. The conventional method of neural networks is used for detecting the emotion. The accuracy of the emotion detection has reached its best using the CNN's. This paper produced unique way of compiling both age gender predictions with the emotion recognition which is of a great usage in future tech.

CHAPTER 3

PROBLEM DEFINITION

The main motive is to develop an age and gender estimation method towards human faces which will continue to possess an important role in computer vision and pattern recognition. Apart from age estimation, facial emotion recognition also plays an important role in computer vision. This implementation proposes a new framework of Convolutional Neural Network for the simultaneous tasks of age estimation, gender recognition and emotion recognition on face images.

CHAPTER 4

SYSTEM REQUIREMENTS SPECIFICATION

Hardware Requirements:

1. CPU Intel Pentium 2 or higher.
2. Cores Minimum dual core.
3. Memory 8 GB or higher.
4. Hard Disk space 100 GB or higher.

Software Requirements:

1. Python
2. Pandas And Numpy
3. Keras
4. TensorFlow
5. SeaBorn

CHAPTER 5

SYSTEM DESIGN

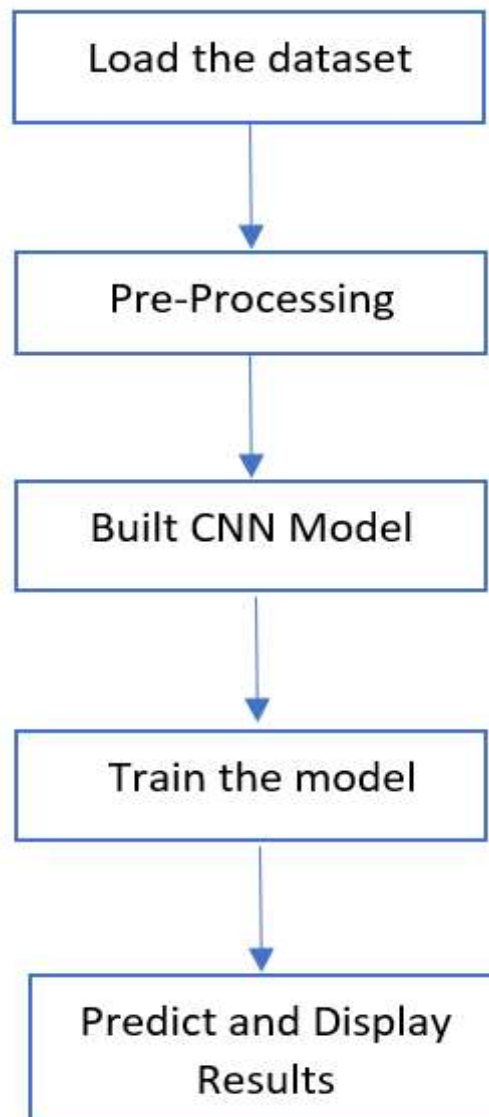


Figure 1: System Design

Data Collection

- Web crawler.
- Data for the website Udemy is already available from Kaggle.
- Collection of Computer Science courses.

Preprocessing

- Converting the image to greyscale.
- Applying Anti-Aliasing on the images.
- Normalizing the images.

Building and Training the model

- Adding Convolution neural layers
- Add Relu Activation Function
- Train the model with the dataset

Display the Results

- Model predicts the age and gender

CHAPTER 6

CONCLUSIONS AND FUTURE WORKS

The proposed framework is capable of age estimation and gender recognition simultaneously in a fast and efficient way. Misclassifications might occur because people from different ethnic groups have different facial characters, which might slightly alter the actual age from the predicted age. The use of glasses might affect the age classification by interfering with the features learned. In our research, we have also learnt that a company like Apple Inc., is also working on a model to help curb emotional illness by using a camera to detect behaviour and facial expressions. Thinking about the future, it would be interesting to implement this model in a live business service. The project can also be applied in social media and content streaming services to customize advertisements and content to the various users. In the field of e-commerce, the applications framework can help in identifying the various products that one can order to help them feel better. Also, in the field of surveillance, this application can be linked up to a CCTV system and can monitor the various facial expressions and can potentially identify the cause for threats to the society.

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