Movie Review Using Emotion Detection

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ABSTRACT

Movie review is a general process taking place whenever a movie is released. The nature of movie is always a question for movie viewers. The release of movie makes viewers enthusiastic and they won't be able to know the absolute nature of movie. Nowadays after the release of a movie a third person will be standing outside the theatre to know about people feelings. They will be holding a recording mic and another person will be taking video of the process. After the questioning is over, they release the video to internet or there private channels to show the nature of movie. Hence a live review of movie is not possible at the moment. This project presents a solution such that a live review is done at the time when movie is running in the screen. Emotion detection is the process of identifying human emotion. With the help of machine learning model we can have trained classifier and the nature of human emotion can be identified. A high definition camera inside the hall can detect faces of people and detect the emotions they are showing at each second. This system updates the review during each second and review about the movie will be updated at the present time thus getting a live review. By implementing this project the review about the movie can be seen at the present time through a web application. Facial expression recognition enables computers to understand human emotions and is the basis and prerequisite for quantitative analysis of human emotions. First, we look at different representations for faces in images and videos. The objective is to learn compact yet effective representations for describing faces. We first investigate the use of descriptors (of algorithm) for this task. Generally three important steps involving in the face recognition system are: (1) detection and rough normalization of faces, (2) feature extraction and accurate normalization of faces, (3) identification and/or verification. Having developed these representation, we propose a method for labeling faces in the challenging environment. The face feature tells clearly what is their opinion about the visual experience thus we can rate the movie according to their opinion. Through machine learning, sentiment analysis can be acheived with greater accuracy .There are many ways for facial emotion detection like Viola-Jones algorithm, convolution neural network method from deep learning. The efficient algorithmic method from above can be used to obtain a better output to know about an individuals facial emotion. In this project we deals with sentiment analysis through facial features and gives rating about the movies.

Keywords : Sentimental Analysis, Machine Learning, Convolution Neural Network (CNN).

I. INTRODUCTION

Movie review is a general process taking place whenever a movie is released. The nature of movie is always a question for movie viewers. The release of movie makes viewers enthusiastic and they won't be able to know the absolute nature of movie. Nowadays after the release of a movie a third person will be standing outside the theatre to know about people feelings. They will be holding a recording mic and another person will be taking video of the process. After the questioning is over, they release the video to

internet or there private channels to show the nature of movie. Hence a live review of movie is not possible at the moment. This project presents a solution such that a live review is done at the time when movie is running in the screen. Emotion detection is the process of identifying human emotion. With the help of machine learning model we can have trained classifier and the nature of human emotion can be identified. A high definition camera inside the hall can detect faces of people and detect the emotions they are showing at each second. This system updates the review during each second and review about the movie will be updated at the present time thus getting a live review. By implementing this project the review about the movie can be seen at the present time through a web application.

II. METHODS AND MATERIAL

This paper aims at designing a technique for live movie review using machine learning and emotion detection. The system consists of four modules: extraction module, normalization module,training and prediction module, display output.

In extraction module, we detect all the human faces inside the hall. For this we use opencv platform with python face detection coding. High definition cameras can be used for multiple face detection. The facial landmarks are obtained and it is extracted. After extraction, normalization of facial landmarks are done. Since one person may have different head poses in camera, for enhancing the performance of the proposed system, we apply a normalization step before selecting features. Normalisation is one of the techniques used in data science to bring features in a dataset to the same scale. When we normalize a feature, all features value will be in the range of 0 to 1. We use viola jones algorithm for sentimental analysis. The basic principle of the Viola -Jones algorithm is to scan a sub-window capable of detecting faces across a given input image. After normalization comes training and prediction method. The computed

features are used as input of a trained classifier to predict emotion for each person. At training stage, the algorithm estimates model parameters based on a training dataset.
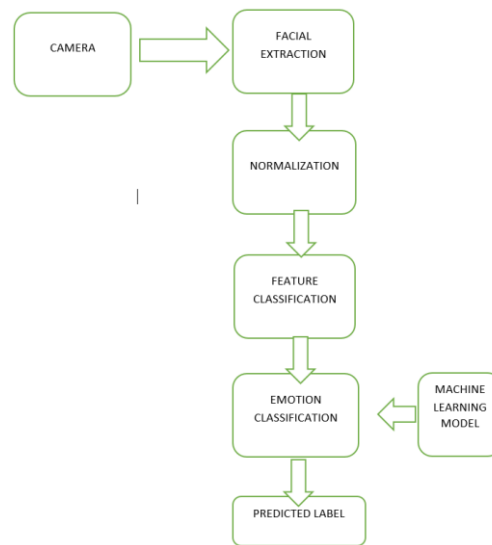

Figure 1. module representation

At prediction stage, the algorithm uses trained model to predict the outcome based on new data. Convolution neural network is also used as image recognition algorithm. It can also be used for other classification and other user problems. After this comes display unit where the data are displayed to application/webpage.

Movie review using emotion detection consists of camera that captures the faces of people inside the hall. A gpu powered computer is needed for image recognition and processing. Opencv platform is used and python coding language is used. A database management system is used for storing training images. A webpage displays the data that is received.

III. IMPLEMENTATION

The implementation details of four modules are described in this section. We develop this method for solving movie review problem that is faced today. We firstly detect all human faces and extract facial landmarks from each observed face. We normalize facial landmarks and calculate the corresponding

feature. The computed features are used as a inputs to a trained classifier to predict emotion for each person. Then gather this data to the display application or webpage.

A. Extraction

Face detection is an important step for image classification since only the principal component of face such as nose, eyes, mouth are needed for classification. Face detection is done by extracting the feature points of face. This is the initial step.
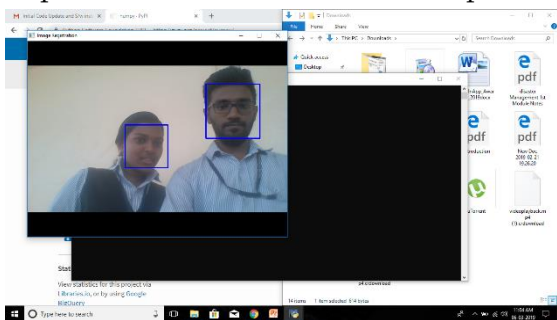

Figure 2

The faces are captured by high definition camera continuously.
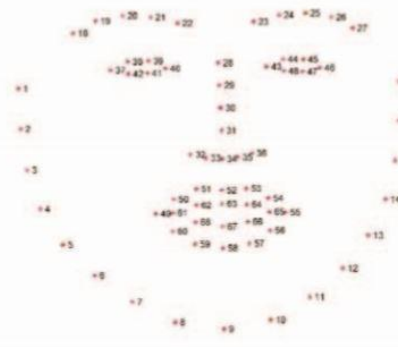

Figure 3. example for landmarks

The facial landmarks are identified. For emotion detection this is the primary stage. Examples of some emotions are shown in figure.
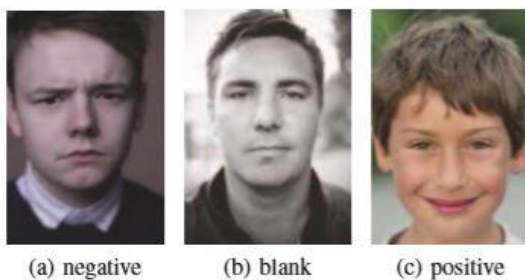

(a) negative   (b) blank   (c) positive

Figure 4. Emotions

B. Normalization

Normalisation is one of the techniques used in data science to bring features in a dataset to the same scale. Face component displacements are not the same for different subjects and perhaps even each person does not have a unique expression for the same emotion. For example, all people express the Sadness, but the way of displaying this emotion is not the same for all subjects. Other emotion expressions also have a similar situation. Facial expression variability is a basic problem in facial expression recognition systems. Variability in facial expression more occurs in geometry of facial components (such as mouth and eyes); however, creases, wrinkles, and furrows caused by expression, have less variability than facial geometric situation. Hence face geometry is normalized into a fixed geometric model, and then facial expression is recognized using appearance features representation. Due to the importance of mouth and eyes regions in emotion expression, to extract sufficient information, these regions are defined in their maximum size in geometric model. For normalization, first localized landmark points of each image are mapped onto fixed model coordinate. To do this, we use convolution neural network algorithm. Figure 1 illustrates an example of geometric normalization for a face image.

C. Training and prediction

In training stage,the algorithm estimates model parameters based on a training data set. We basically try to create a model to predict on the test data. So, we use the training data to fit the model and testing data to test it. The models generated are to predict the results unknown which is named as the test set. As you pointed out, the dataset is divided into train and test set in order to check accuracies, precision by training and testing it on it.

The proportion to be divided is completely up to you and the task you face. It is not essential that 70% of the data has to be for training and rest for testing. It completely depends on the dataset being used and the

task to be accomplished. So, assume that we trained it on 50% data and tested it on rest 50%, the precision will be different from training it on 90% or so. This is mostly because in Machine Learning, the bigger the dataset to train is better.

Prediction" refers to the output of an algorithm after it has been trained on a historical dataset and applied to new data when you're trying to forecast the likelihood of a particular outcome, such as whether or not a customer will churn in 30 days. The algorithm will generate probable values for an unknown variable for each record in the new data, allowing the model builder to identify what that value will most likely be.
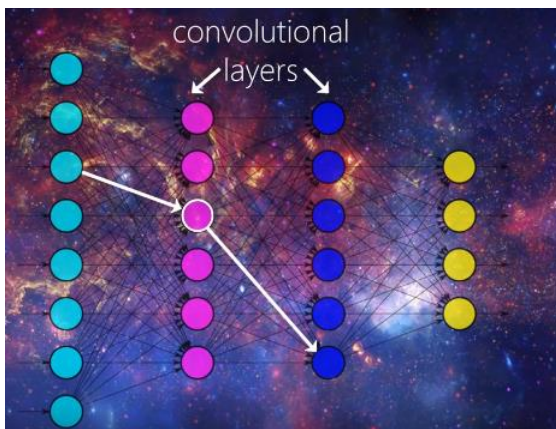

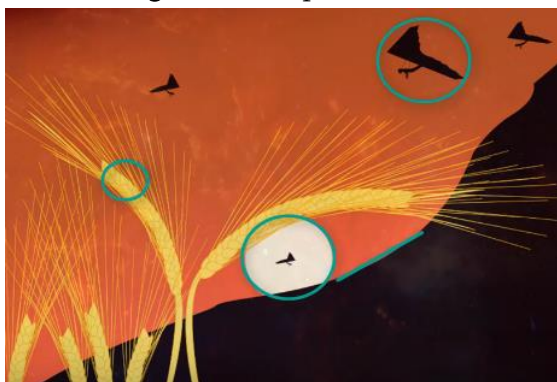**Figure 5.** example of CNN

Figure 6. figure showing marks

The algorithm used for our project is convolution neural network algorithm and viola jones algorithm. Voila Jones is the oldest and most recognized face algorithm available for the face detection from the image. The Viola Jones face detector analyzes a given sub-window using features consisting of two or more rectangles. In deep learning, a convolutional neural network (CNN, or ConvNet) is a class of deep neural networks, most commonly applied to analyzing visual imagery.

D. Display

The final is the display unit where we can find the corresponding emotion shown as a database and with this data we will rate the movie according to the emotions.

IV. RESULTS AND DISCUSSION

There are many feature extraction techniques and some of them are geometry based, template based, appearance based and color based techniques. Supervised and unsupervised classifier are the existing methods for emotion classification. Bakshi, Urvashi, and Rohit Singhal concludes that feature detection techniques are divided as: Feature based technique and Image based technique . In feature based technique facial features are used for detection process and in image based technique multiple faces with clutter intensive backgrounds are detected. To extract feature or facial points from the image different approaches are existing. They are geometric based technique, template based technique and appearance based technique. In geometric based techniques facial points are obtained using the size and positions of principal elements of images. Using appropriate energy function template based methods extract features . Appearance based approach process the image as two dimensional patterns. For face recognition different approaches of such as holistic, feature-based and hybrid approach are existing. Geometric shapes of principal component of faces are identified in geometry based method. In the holistic approach whole face region is taken into account as input . Hybrid approach is the combination of both methods.

In the work of Serban, Ovidiu, features from video inputs as well as transcription on audio as text are combined together. This system uses a method called segmented detection instead of using individual classifiers. The emerging idea of multimodal fusion are studied in this research . NGrams, Smile Presence or Valence are the features used for fusion. SVM classifier is used for classification process. Youtube Opinion corpus containing 48 videos are selected for training and testing. Hua Gu,Guangda Su and Cheng Du proposes a method in which feature extraction are automatically performed. The operator SUSAN (Smallest Univalue Segment Assimilating Nucleus) is used to obtain the edge and ridge position of feature. The experiments are conducted on face database that has been created in their own lab itself with 270 people each provided 7 face images. Experimental end result shows that locating of feature points is correct and faster. Kwok-Wai Wong, Kin-Man Lam, Wan-Chi Siu proposes a more reliable approach for face detection and extraction using genetic algorithm and Eigen face technique. Firstly possible eye contender are detected and based on this possible face regions are detected with the help of genetic algorithm. Every face contender are then normalized by adjusting the shirring angle during head movement. An histogram equalization is done reduce the lighting effects. After that the fitness value of the face is calculated by projecting onto the eigen faces. Selected facial points are then verified by calculating the similarity and existing facial features. This work shows a great result even though when the image undergoes a shadow or shirred. Michael J. Lyons, Julien Budynek, and Shigeru Akamatsu proposes a technique which will automatically recognize images of faces. This system uses a two dimensional Gabor wavelet representation for classification process. Three image sets are tested with sex, race and expression as class labels. Dataset contains 193 images of emotions done by nine female Japanese models. Another dataset used is a facial expression image set with 51 male expressors and 59 female expressors.

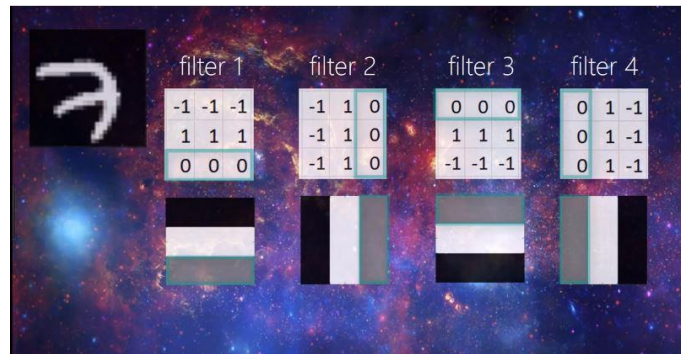## 1.Filter for simple image(according to CNN)

Figure 7

This is an example figure showing the working of CNN.

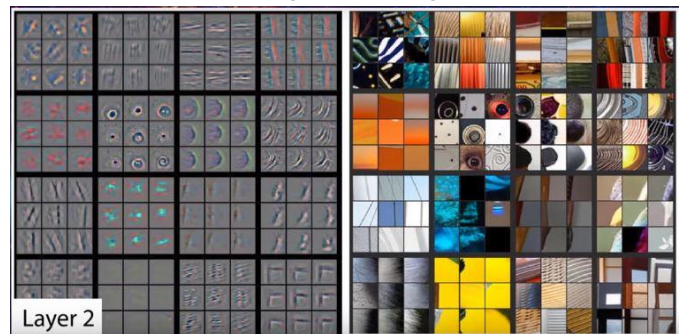## 2.Filter for harder image(according to CNN)

Figure 8

This is an example figure showing the working of CNN.

After working on cnn algorithm and viola jones algorithm we get an improvised result for our project. The emotion analysis can be easily done. The layer of filters help in greater analysis of face and the emotions present in the viewers face. The machine learning algorithm makes this project more efficient in working. This project helps in attaining emotions in a better way.

V. CONCLUSION

The main objective of the project is to detect the facial emotion and find the review of the movie. For detecting the emotions from the image we use the well-known Viola Jones algorithm. By using classifier the face and emotion recognition of the person is done. We get a live review using this method. This method is faster than the current method that people are

doing. Through our webpage or web application we can know about the movie review at the present time during the movie is played. Live stream is the speciality of our project. The use of machine learning makes this more advanced because the system can be updated with new features. The scope of this project is very high.

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