Calculating The Impact Of Event Using Emotion Detection

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Abstract*: Regardless of the extraordinary advancements in Artificial intelligence, we are still far from having the capacity to normally associate with machines. Feature analysis in emotion recognition is significantly less concentrated than the facial recognition, In events like lectures and meetings we access their effect on people with the help of reviews, There might be a case where people don't give their time in writing their opinion perfectly, with the help of this system we could find the behavior trends of the audience in the whole keynote and assess in which part of event the audience were feeling bad or good about the event.

Index Terms: Emotion Recognition, Face recognition, Neural networks, Machine-learning.

I. INTRODUCTION

The facial perception where related to the chronicity, illness and social competence, Emotions take an essential part in day-to-day life, People can recognize someone else's feelings and respond in a hasty-manner with certain circumstances. For example, "A judgment of a man using psychological study", Facial emotion recognition is a challenge because of its hazy, where features are effective for the task of which extracting effective emotional features is an open query [1]. It is ordinarily utilized for security systems, mobile application unlocking systems as well as iris scan unlocking systems for high-tech security of latest tech for example, unique mark or eye iris recognition systems, incompletely in light of the fact the machines don't comprehend the feeling states. We can also judge a man if he is convinced for the inspirational speech or not. Emotion is a conscious experience characterized by extreme mental movement and a certain degree of pleasure or disappointment. Scientific conversations have had different implications and there is no general agreement on the definition [2].

Emotion recognition using facial image analysis, which aims to recognize the emotional states of person from image analysis has been drawing increasing attention for example, recognition when we are in a unstable situation, and the excitement caused by our body and our sensory system[3] (rapid heartbeat, breathing, sweating, muscle pressure) is absolutely necessary to experience our anxiety tendency. However, various hypotheses ensure that this feeling is separate and can pass before insight.

The face of a deliberate feeling is to show a psychological picture of this feeling of past or speculation,[4] which is once again linked to a satisfactory state of joy or dissatisfaction. In-case there is a chance for that device collaborating, on the other hand, the machine learning using AI is effective in doing the job and there is a discussion in investigating human behavior and working in a similar manner. To do this many imaginable ways we can be visualized using facial discovery to get a precise and accurate way to examine human feeling and behavior which the famous company named Volvo developed a car that conducts job interviews in Volvo's AI stunt [5].

In this paper, we utilize the image processing that is collaborated with deep neural networks to extract features and emotions from the input and show that they are usable for facial emotion recognition. Initially we produce an emotion state for each & every frame of the video feed using the open-cv, keras and neural network system, this featured video was then bolstered into the emotion detection module which was an extraordinary simple and viable neural network system utilizing image processing, to distinguish the face-dimension of feeling.

In the next section, we relate our work to the prior facial emotion recognition studies and then describes our proposed approach in-detail in section-II, different types of approaches Neural-networks further describes about the Sentiment Analysis,Opinion-Mining,Convenience Sampling Algorithm, Cascade classifiers, Keras and its Highlights and elaborate working of the proposed model in section-III, the details of our algorithm is described in section-IV, where the Fig 2 shows the overview of the approach, flowchart in section-V, and later followed by the results section-VI later Conclusion follows.

II. PROPOSED APPROACH

For emotion recognition, we select the video feed, face, facial formats, and the base highlight features added to the image process techniques through neural networks from feature stream of emotions. In emotion detection, the state or emotion of the person is found from a live video feed, the major components here are an emotion detection model and library likely used open-cv, in order to get the live video feed from the camera. Open-cv is the best way in-order to work with the video formats, it can get individual frames from the video and can perform many

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complex operations on the video feed that is available.

There are vivid approaches as well as techniques that can explore the emotion recognition of the person, like genetic algorithm, SVM, RSVM, DFA, Neural networks etc.

Sentiment Analysis

Sentimental analysis is the process of identifying and categorizing opinion expressed in the plain text, especially in order to determine whether the writer's attitude towards a particular-topic, product, etc. is positive, negative, or neutral.

Opinion mining

Opinion mining refers to the use of natural language processing, text analysis, computational linguistics, and biometrics to systematically identify, extract, quantify, and study affective states and subjective information.

Face Recognition

A facial-emotion recognition system is an innovation technology for distinguishing or confirming an individual from an advanced picture or a video from an input source. There are different strategies for facial-emotion recognition system working, yet they work by facial highlights from given picture or video with appearances of faces of every individual inside a database. It is additionally ordinarily utilized for security systems, mobile application unlocking systems as well as iris scan unlocking systems for high-tech security of latest tech.

Convenience sampling algorithm

Convenience sampling is a type of non-probability sampling system that includes the sample being drawn from that piece of the population that is near hand, This sort of sampling most helpful for pilot testing.

Pilot test is a little scale primer examination leading to assess feasibility, time cost, unfriendly occasions and enhance the investigation plan preceding execution of full-scale inquire about undertaking.

Cascade classifiers

Instead of applying all the 5000 features on a single window, which will consume more time. we can group the features into different stages of classifiers and apply one-by-one.

a) Normally first few stages will contain very a smaller number of features

b) If the window fails in first stage, discard it.

c) We cannot implement all the features on it.

d) If it passes the first, apply the second stage of features and continue the process.

e) The frame that passes all the stages is a face region.

Open-cv contains many pre-trained classifiers for face, eyes, smile etc. in XML files. In this project we used Haarcascade_frontalface_default.XML.

Keras

Keras is a python-based deep learning frame work which is actually an API of TensorFlow. Keras is a library gives state building squares to develop deep learning models. It doesn't handle low level operations like tensor products, convolutions etc. Instead it handles on specialized, well optimized tensor manipulation library, to do it keras works as "backend engine". Rather than single tensor library and implementing keras handles the problem in a modular integrated way, several different back end engines can be plugged seamlessly in to keras

Relative software's for deep learning

- Neural engineering object (NENGO)
- Numenta, platform for intelligent computing.

The four major highlights in "KERAS" are

1. Deep learning library:
   a) high level API
   b) runs on top of TensorFlow, Theano, CNTK.
   c) Keras basically runs on top of either TensorFlow, Theano, CNTK.
2. Keras modular:
   Since it runs on the top of any of these frame works, keras is amazingly simple to work. You can wonder why well building models are as simple as stacking layers and later connecting this graph.
3. Open source:
   Keras attracts the lot of attention because it is a open source and it is actively developed by all the contributors across the world.
4. High performance:
   High performance API is used to specify and train differentiable programs

"High performance normally flows through Keras."

Note: Keras had over 4,800 contributors during its launch and initial stages. But now the number has gone up to 2,50,000 where the growth rate is >2X year by year and the good startups attracts good attraction.

At this time keras has 3 back end implementations like TensorFlow, Theano, CNTK (cognitive tool kit) tensor is a open source symbolic tensor manipulation frame work developed by google. Theano is an open source symbolic manipulation frame work developed by LISA lab at university of Montreal's CNTK is an open source tool kit for deep learning

Neural Networks

Neural system is a feed forward system which is equipped for taking in abnormal state portrayal from crude information and gives successful classification and features, With the help of prior knowledge on the algorithms that explore the feature like facial emotion detection from the input, the results are quite accurate with the use of neural networks, so we prefer neural networks to get the results.

The neural network that is used here provides very accurate when the training set is extensively short and out-performs the keras on our study.

Workflow for face Recognition Module

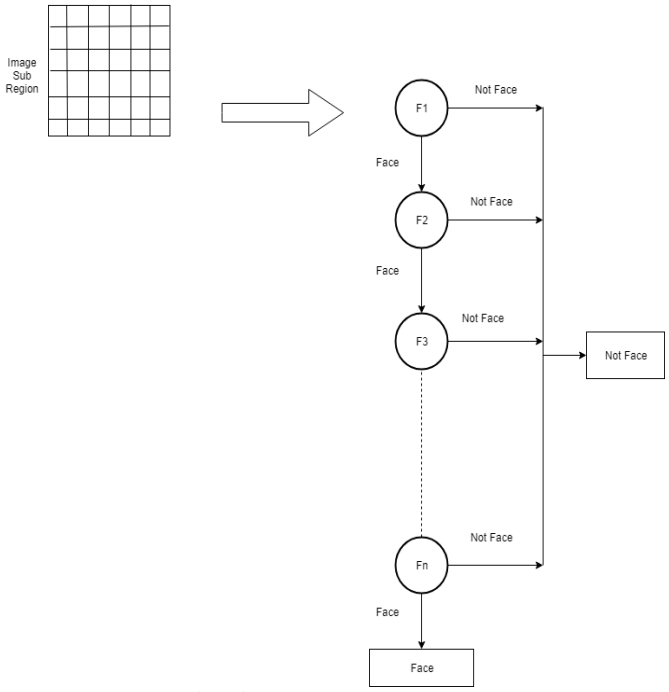

Fig. 1. Work-flow for Face Recognition module

The emotion detection model works using functionalities in keras-library, the keras is an advanced deep learning library which uses TensorFlow and Theano as its backend. Here we take the video feed from the open-cv, we split it into individual frames and identify faces of the persons. The faces that are identified in the previous step are sent in to the emotion detection model and the state that are neutral, happy, sad, surprise, angry are identified. As the nodes are plotted on the essences (faces) of characters in feed which indicates the facial movements, situation and position of the facial features gives the information of emotion. The illuminated nodes display of the expression however provides us more accurate results, the nodes presentations of the articulation however give us progressively exact outcomes, while considering the nodes, the movements or displacements of the upper territory and the lower region of the face helps on perceiving the 5 distinct kinds of passionate emotions. The images of the people that are identified at their equivalent emotional state are segregated.

Proposed Raw-Methodology to extract the trends of emotion probability

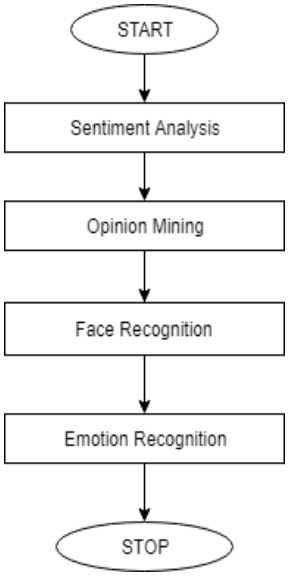

Fig. 2. The steps for the proposed model

We thus analyses the quality of a certain conference or a meeting by finding the percentage of people whether they like or dislikes it.

Real-time Applications using keras

1.Object recognition
2.Google car, now cars are learning how to drive using this Deep learning
3.Alpha go- Board game [go]-developed by Alphabet is google deep mind.
4.Speech Recognition
5.Chat bots (Siri, Cortana, Google Assignment)

III. WORKING

In this proposed paper, we build a facial-level feature from the video feed estimations and employ on emotion detection module to recognize the emotion of each individual.

we are detecting the face by using Tensor flow, this is a face identifier which executes utilizing TensorFlow, as depicted in the paper Face Net. With sufficient training data and appropriate training strategies neural networks performs very well in many machine learning tasks as well as the knowledge engineering tasks. (ex: -emotion recognition using facial image analysis), It likewise utilizes the marvels of a discriminative component learning technique for profound face acknowledgment. The working specifically indicates the workflows of the task that goes on to identify the emotion of the person which helps in analysis the trends of the emotions of data and estimate the impact of the event either by graph or the pie-chart. Since the yield as of now gives extensive emotional data and the order doesn't include excessive training, which is important to utilize neural systems for feeling characterization.

This model will be helpful in detecting the moods of the audience or the users, on the other way it might also be used in the Educational institutions to analyze the trends of the emotions of the students. The results indicate the

diverse facial regions are more informative for different emotions, the experimental outcomes show that the proposed methodology successfully takes in the enthusiastic data from low level features and prompts 30 % relative exactness improvement contrasted with different methodologies.

IV. ALGORITHM

1) Start.
2) The recorded video or the live feed will be given as input.
3) By the help of open-cv the Image processing is done.
4) Video or live feed will be to through the open cv to get the analysed video with the help of keras.
5) The analysed video will be sent to the emotion detector module which is in the keras library.
6) From the keras library we will achieve the EMOTION OF PERSON through facial image processing.
7) Within the process of identifying the emotion detector we will capture the images in the live feed or video and sort them accordingly to provide the statistical data.
8) Stop.

V. FLOWCHART

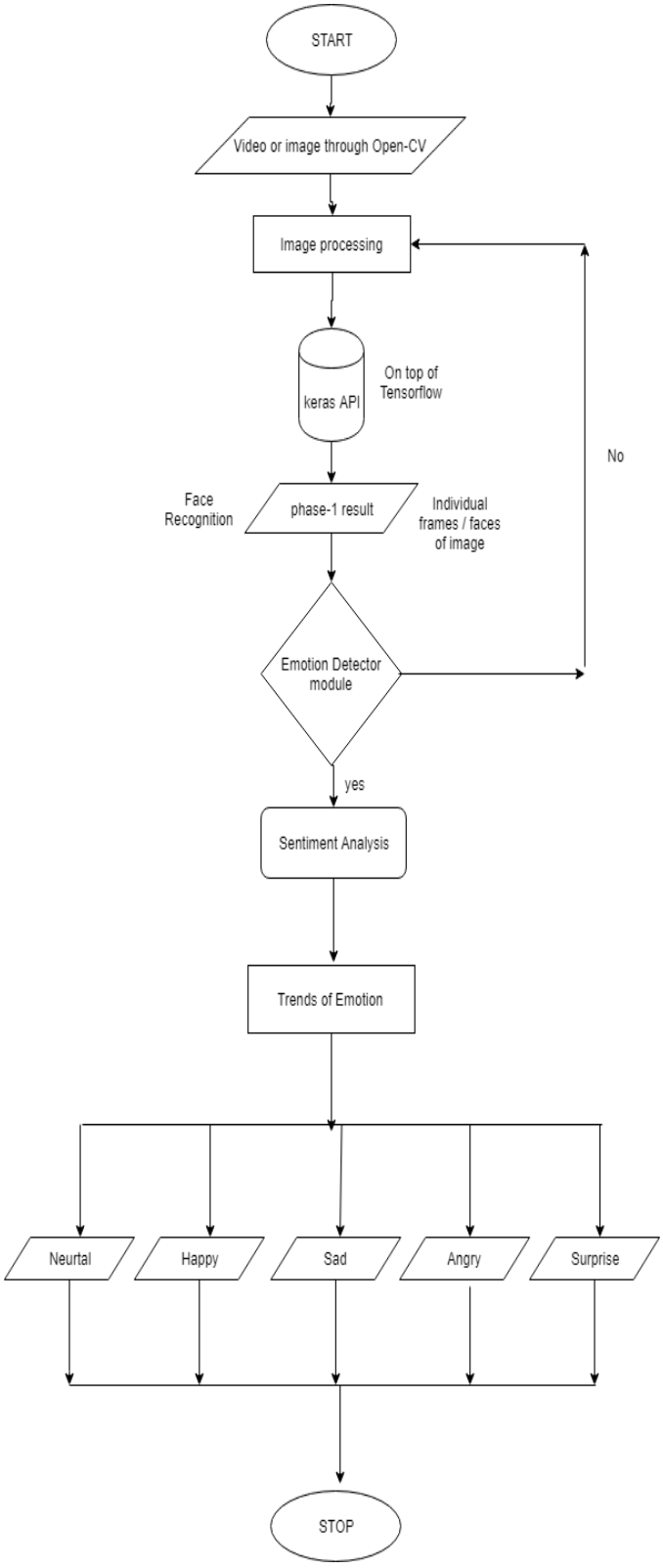

Fig. 3. The flowchart of the proposed model

The flowchart starts with video or live feed, we will import the data from this live feed and send it to open cv. the data will now be processed to produce an analyzed video; thus, the initial phase is complete. Now the emotion detection module that we build comes in to action and uses the functionalities of keras library to process the data from the analyzed video to distinguish the emotions into following categories:

1. Neutral
2. Happy
3. Sad
4. Surprise
5. Angry

If any anomalies occur in the above algorithm the process stops and redirects to the initial module of second phase i.e. analyzed video. thus, it gives the option for the algorithm to cross check its output

VI. RESULTS

In an experiment with 10 undergraduates, video-feed of distinguishing faces through facial image analysis and the outcome to demonstrate the moving displays of happiness, sadness, surprise, anger, neutral. The results of the proposed model that are obtained from the emotion detector module where the input is given as the live video feed.

Our experimental results show that proposed methodology considerably supports the execution of emotion recognition from facial image analysis and it is promising to utilize the neural networks to take in the passionate data from the low-level anterior features.


Fig. 4. Neutral


Fig. 5. Happy

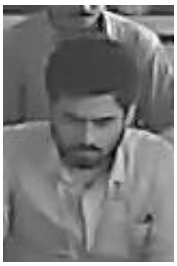
Fig. 6. Sad


Fig. 7. Surprise


Fig. 8. Angry

This module of emotion detection extracts the features of the faces from the OpenCV to detect the trends of emotions like Neutral (Fig.4), Happy (Fig.5), Sad (Fig.6), Surprise (Fig.7), Angry (Fig.8).

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In an Experiment with single YOGA expert, video feed of distinguishing face through facial image analysis and the output is to tell what exact emotion of the person feels.


Fig. 9. Neutral


Fig. 10. Neutral


Fig. 11. Happy


Fig.12. Surprise

Fig. 13. Sad


Fig. 14. Neutral


Fig. 15. Angry

This YOGA module of emotion detection extracts the features of the faces from the OpenCV to detect the trends of emotions like Neutral (Fig.9,10,14), Happy (Fig.11), Sad (Fig.13), Surprise (Fig.12), Angry (Fig.15).

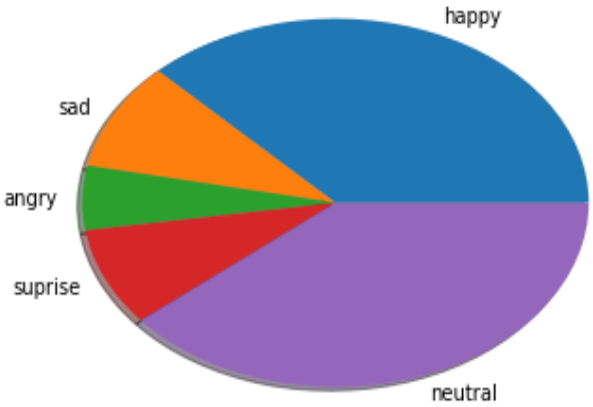

Fig. 16. The pie chart indicates various trends of emotions in live feed

The Pie-chart shown in Fig.16 indicates the statistics of different emotions of persons
in the given input video feed.

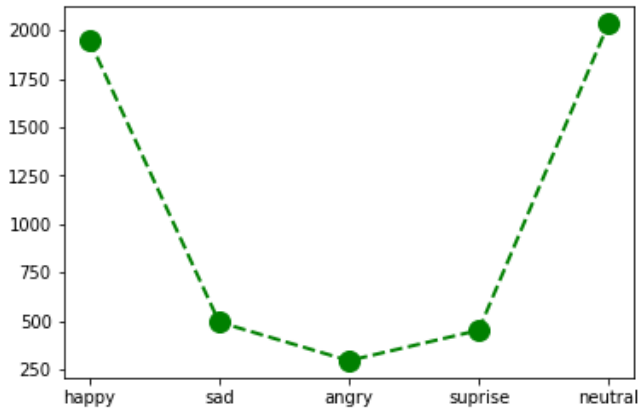

Fig. 17. The plot to the visualization of data

The graph shown in the Figure 17 is the plot between the various trends of emotions and population count.

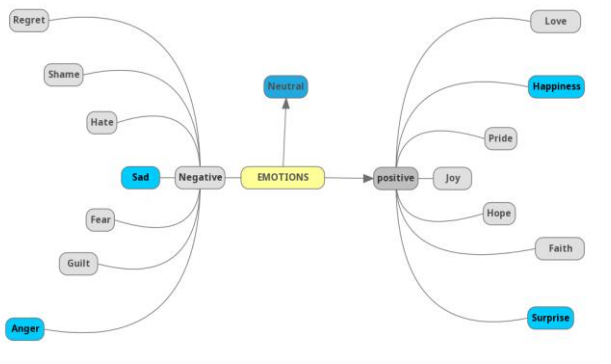

Fig. 18. Classification of Emotions for the Algorithm.

This fig shown in the Fig 18 is to estimate the different types of emotions that can be distinguish through the face.

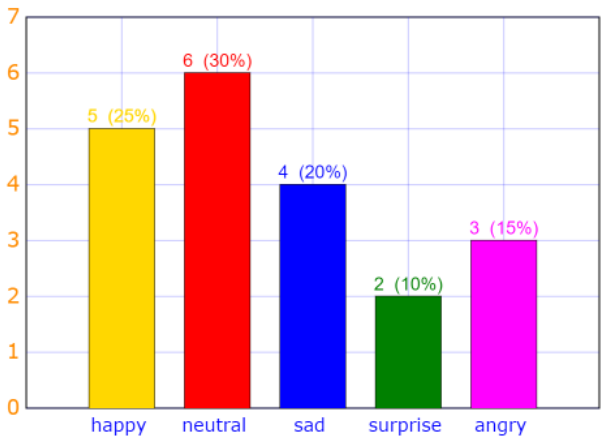

Fig. 19. The bar graph plotted to the visualization of data

The graph shown in the Figure 19 is to plot a bar chart data visualization of number of people and their state of emotion that they are expressing.

VII. CONCLUSION

As our proposed model, we utilize the neural networks and gauge the feeling states for each casting frame in the video to detect the Emotions of the persons in the live feed accurately. So, that it can be implemented in the mood detection of the audience and the other way it can also be implemented in the Educational Institutions, Baby monitoring systems, HR for employee section, Game survey etc., for analyzing the trends of the Emotions of the students.

VIII. FUTURESCOPE

This proposed model can be made more accurate by integrating with heart beat detection sensor module if the target is single person, this might be helpful in various fields and technology like character visualization.

Face recognition today has many uses in different types of innovation technologies, for example, mechanical autonomy (robotics) as well as security. It is ordinarily utilized for security systems, mobile application unlocking systems as well as iris scan unlocking systems for high-tech security of latest tech which is adopted for its unique invasive nature. Even the famous Volvo Company developed a car that conducts job interviews in Volvo's AI stunt.

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