A Novel Approach for Deep Learning Models Based on Web Applications With The Effective Use of Proposed Virtual Assistant

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Abstract—

Human being expresses himself in terms of gestures that could be hand gestures, facial expression, or text grammar. The emotion recognition system is the Human- Computer in- teraction medium the way a computer program can understand the human feelings.This study recognizes the facial expression of the person by feature detection algorithm. The proposed method uses Deep learning models of Python library that is functions of Deep analyze library to classify the facial expression into namely seven categories: Happy, Sad, Angry, Disgust, Neutral, Fear and Surprise. The purpose of this study is to identify the patterns of emotion changes from the images throughout the video capturing and create a dashboard and analyze the actual trend in the emotion change. The system tends to then understand the emotion via. Chat with the person and then give a result based on the summation of both the trends.

Index Terms—Emotion Recognition System, Virtual Assistant, Machine Learning, Feature Extraction, Sentimental Analysis.

I. INTRODUCTION

EVA: Emotion Virtual assistance is based on the concept of Emotion Recognition system with machine learning. The EVA uses the deep learning algorithm to identify the fea- tures of the human face and then classify it to the seven broad categories. Expression is the way the human showcase his feeling. A ordinary human utilizes hand gestures, body language, eye language and facial expressions to show and express his feeling but in order to make the computer or machine understand this we need the emotion recognition system. The features of the image captured during the live video capturing is evaluated and then classification or cluster- ring can be done on the basis of the categories score of feature extraction. Emotion virtual assistant is a machine that works as an assistant to drive the user throughout its software component to analyze the emotion he persist. The Emotion visual assistant act as a human computer which uses machine learning and deep learning concept to determine the current state of human feelings.
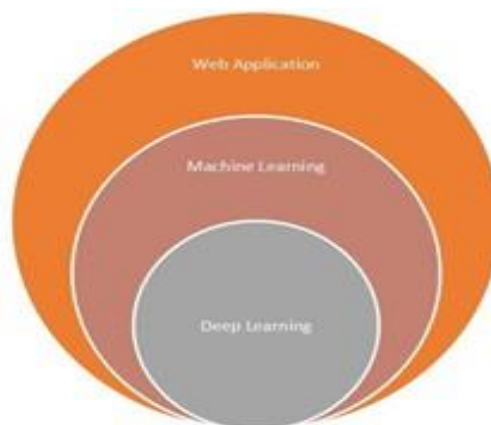

Fig. 1. Modulation of the EVA

Fig 1: Components of EVA technologies

The emotion recognition system have a wide range of usage in the coming world of frauds. It helps to identify the psychological level of the human also it can be used to analyze the stress and anxiety level of the person. The emotion recognition system till today was used by the IOT devices and Desktop application. But EVA brings out an effort to integrate the system with web application and allow user all over the world connected through internet to utilize its applications. The Emotion Virtual Assistance "EVA" can be used in the industries to identify the stress level the employees have also it can identify the satisfaction level of employee from the organization. It can be used in medical

industry to analyze the behaviour of autistic disabled people, people with anxiety and depression etc.
The emotion is detected with the help of Deep learning algorithms which utilizes the neural network analysis to read and classify the images. The aim is to make the machine able to understand and have a human like behaviour. Not only EVA works on images it identifies the emotions via sentimental analysis of the text the forward one uses to communicate with the virtual assistant. The result is then formulated based on the sentimental analysis and feature classification so as to prepare a dashboard consisting of the mixture of the human's current emotion.

II. LITERATURE REVIEW

Facial expression is a sort of powerful manner of human conversation. Facial expression popularity is the important thing era for knowing human-laptop interplay to be the emo- tional computing device. Facial expression has an extensive software prospect in lots of studies fields, along with digital reality, video conference, client pleasure survey and different fields. Despite of first-rate encouraging development were made on this studies field, there are nevertheless many troubles current. On one hand, the conventional characteristic extraction techniques are absolutely depended on human experience, which continues to be too complex for actual software. There- fore, the conventional techniques are very hard to extract bene- ficial capabilities comprehensively and successfully[1]. On the opposite hand, the conventional techniques cannot dispose the huge statistics and gain higher overall performance. So, it isn't't easy to satisfy the actual software requirement. In maximum situations, this sort of method cannot be hired successfully. In the sphere of education, current digital studying environments effectively simulate interplay at a cognitive degree in the course of conventional coaching processes . In the procedure of human-laptop interplay, instructors naturally count on a facial popularity device to have the ability to detect, examine and procedure feelings a good way to get good coaching effect, along with perception, expertise and expressing feelings [2] If in digital studying environments, college students display one of a kind expressions in videos, instructors can perceive whether or not the scholars apprehend their coaching content material in step with college students' one of a kind expres- sions, and might regulate their coaching programs.
In digital environments, college students' emotional statis- tics can be acquired from a chain of video frames. Therefore, to gain actual time expertise of college students' feelings, accuracy and time wishes to be balanced. To improve accuracy, extra video frames are required, increasing computation time. On the opposite hand, in pursuit of performance, we'd lessen the accuracy because of this that collection much fewer char- acteristic statistics. Experimental consequences from modern solutions display that during a few instances' accuracy is higher, however time spent is likewise high, along with Salman et al who used Decision Trees to perceive Facial Expressions. Other solutions have one-of-a-kind limitations; for example,Chaetal provided low-fee facial expressions on a cell plat- form by simply extracting lip capabilities, spending much less time however accomplishing much less accuracy. To discover the fine answer for emotion popularity in studying digital environment, each accuracy and performance wishes to be achieved. Optimization of popularity of emotional adjustments with inside the facial capabilities of online learners, will permit instructors to regulate coaching techniques and techniques, provide actual-time comments to college students, and gain the fine coaching quality.
The intention is to discover the fine answer for emotion popularity primarily based totally on facial popularity in digital studying environments, in actual time. To gain this intention, it is essential to enhance the accuracy and performance of facial popularity systems. Research efforts in human laptop interplay are targeted at the approach to empower computers (robots and different machines) to apprehend human intention, e.g., speech popularity and gesture popularity systems[4]. In spite of considerable achievements on this place in the course of the beyond numerous decades, there are nevertheless a lot of troubles, and plenty of researchers are looking to remedy them. Besides, there is any other vital however left out mode of conversation that can be vital for extra herbal interplay: emotion performs a vital position in contextual expertise of messages from others in speech or visible forms.
There are several regions in human–laptop interplay that would successfully use the functionality to apprehend emotion. For example, it's far established that emotional ability is a critical thing for the next-technology private robot, along with the Sony AIBO.[5] It also can play a good-sized position in smart room and affective laptop tutor. Although restrained in range in comparison with the efforts being made closer to intention-translation approach, a few researchers are looking to understand man system interfaces with an emotion expertise functionality. Most of them are targeted on facial features pop- ularity and speech sign evaluation. Another possible method for emotion popularity is physiological sign evaluation. [8] We believe that that is an extra herbal approach of emotion popularity, in that the influence of emotion on facial features or speech may be suppressed particularly easily, and emotional repute is inherently meditated with inside the interest of the worried device.
In the sphere of psychophysiology, conventional gear for the research of human emotional repute is primarily based totally at the recording and statistical evaluation of physi- ological indicators from each the significant and autonomic worried system. Researchers at IBM recently suggested an emotion popularity tool primarily based totally on mouse-kind hardware. Pi-card and associates on the MIT Media Laboratory were exerting their efforts to enforce an

affective laptop because the overdue 1990s. [6] Although they prove the feasibility of a physiological sign-primarily based totally emotion popularity device, numerous components of its overall performance want to be improved earlier than it is able to be applied as a realistic device. First, their algorithm improvement and overall performance checks have been achieved with statistics that reflect deliberately expressed emotion. Moreover, their statistics have been acquired from handiest one subject, and, hence, their emotion popularity algorithm.

As described, there are five primary feelings: happiness, sadness, fear, anger and impartial which have been identified from a couple of frame moves which include head region, joints, higher and decrease frame moves, arm sure area to enhance the accuracy of emotion popularity system [7]. They have used video datasets to extract movement or kinetic capabilities from speed, area, and symmetry of numerous frame elements beneath Neath three situations as walking, sitting and motion unbiased instances. On extracted geometric and temporal capabilities, ANOVA (Analysis of Variance) and MANOVA (-Multivariant Analysis of Variance) have been carried out to compute relevance of extracted capabilities and normalization of capabilities. To fuse the capabilities, score and rank degree fusion strategies have been used. Thus, it may be visible that the characteristic extraction framework has higher knowledge of feelings than human beings.[9] Future scope said with inside the paper are

1. Along with the frame moves, voice and facial expressions can also be taken to enhance the overall performance due to the fact motion unbiased situations give much less accuracy.
2. Enhancement in equipment to enhance conversation among human and robots
3. Remote sensing of feelings in case of emergency
4. To implement higher equipment for schooling applications in scientific rehabilitation canters.
5. Recognizing feelings from frame moves is but to be explored more. The aim of emotion popularity is to acquire records and examine emotions of subjects, to make suitable responses possible. Such records can be received from special bodily capabilities which include face voice, frame moves, and different organic bodily signals.

III.PROPOSED MODEL

EVA: Emotion Virtual assistance is based on the concept of Machine Learning that utilizes the emotion recognition of live images and predicts the emotion of the particular human being in the image. Human being express themselves using emotions and so their emotion at times matter but in order to make a machine learn the emotion we need to train it accordingly so it could analyze it and give the response to treat the forward person better in the particular emotion. When a human is sad he needs support of a machine ,when he is happy he need someone to share EVA is designed such that it could capture the person image and monitors it continuously and talk to him as per his current state of emotion.

Emotion Recognition and Identification is a very broad area. It can be in terms of the facial Expressions, gestures, text, voice modulations etc. Emotion recognition system does the same it identifies the facial expression of the being forward to identify his emotion status and provide with a specific tuples of digits that is then used to classify the emotion. The classification have seven groups of clusters namely happy, sad, anger, surprise, fear, disgust, contempt. EVA tends to identify them as its base to talk and then uses its sentimental analysis over the text while the chat runs and behaves as a virtual human.

The work process of EVA have the following modules: Face Recognition, Emotion Detection, Dashboard of the Current Mood, Emotion Quotes Library, Sentimental Analysis through text, Assistance to the forward person.

1. Face Recognition: The face recognition system is the first module of the "EVA" this module recognize the face of the person and identify the features that are eyes pupil size, lips width, eye width etc. to extract the feature ratio. Face recognition systems use computer algorithms to pick out specific, distinctive details about a person's face. These details, such as distance between the eyes or shape of the chin, are then converted into a mathematical representation and compared to data on other faces collected in a face recognition database.

2. Emotion Detection: Once the features are extracted now they are classified into the cluster and evaluated on the basis of the classification and the emotion is detected.AI can detect the emotions of a person through their facial expressions. Detected emotions can fall into any of the six main data of emotions: happiness, sadness, fear, surprise, disgust, and anger

3. Dashboard of current emotion: The dashboard for the current emotion describes the set of all the emotion that could be identified and analyzes the exact mood and also delivers lines supporting the current emotion.

4. Emotion quote library: The emotion quote library consist of the function to give the resultant supporting lines related to the final resultant emotion.

5. Sentimental analysis through text: Sentiment analysis (or opinion mining) is a natural language processing (NLP) technique used to determine which emotion is being detected from the text in the chat 6. Assistance to forward person.

The AI project EVA is divided into three modules at brief the first identify the facial expression and analyze the emotion the second is identify the sentiments from the text the words of the former person the third is showing the

analysis on the dashboard. The EVA first takes inputs from the environment in forms of image and text the text goes to model 2 were its sentimental analysis is done and image to model 1 for emotion recognition. On the basis of the resultants from both the models a model 3 is created to get the visualization and analyze the current state.

This is how EVA produces the best results of Emotion recognition by considering the fact that the words of the humans to matter along with the facial expression and then conclude the exact reality . There may be cases when the forge facial expression can be made but the text that is written

Fig. 2. Modulation of the EVA

at instant time cannot actually be forged out easily also it would give the AI agent the better understanding of the current emotion.

IV. RESULTS AND DISCUSSIONS

The results of "EVA" forecast the emotions of the human on the basis of the following the text of current feel and facial expression of the person. The results depict the expressions and the resultant visual boards of each expression that consist of the pie chart that have the analysis of the text chat with the person in front and the second is the bar chart that shows the analysis through the pictures on the video capturing. Also there is a Quote stating the relevant facts and Quote about the resultant emotion. These Outputs are detailed on the web page that is built in python Django, HTML, CSS, JavaScript for the designing purpose of the Page.
The EVA module consist of a voice assistant "Jimmy" who welcomes and directs the user to follow for the next steps. Also there are the other important embedded web-pages like
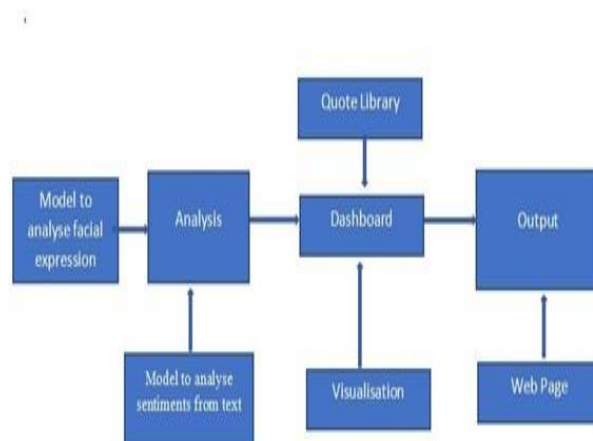
Fig. 3. Working Of Emotion Visual Assistant

About US, testimonials where the users can review it, Its essential features that make it unique. The figure:4 depicts the resultant of surprise, figure:5 depicts angry, figure:6 shows happy ,figure:7 shows fear , figure:8 depicts sadness and figure:9 explain the result of disgust.

Fig. 4. Resultant of Surprise Emotion Expression
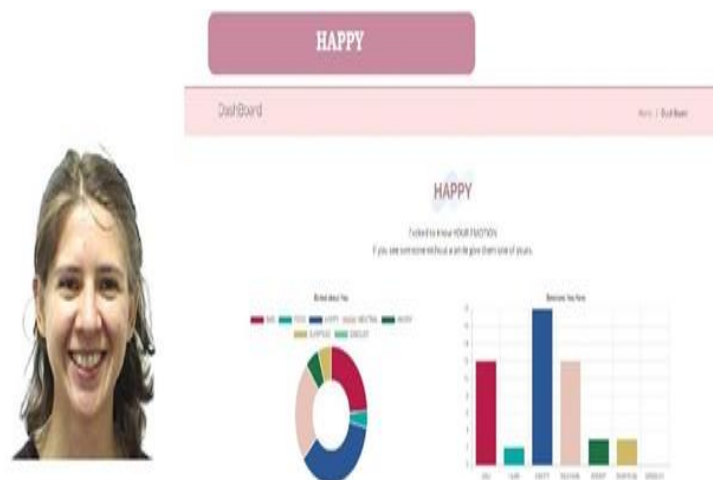

Fig. 5. Resultant of Angry Emotion Expression
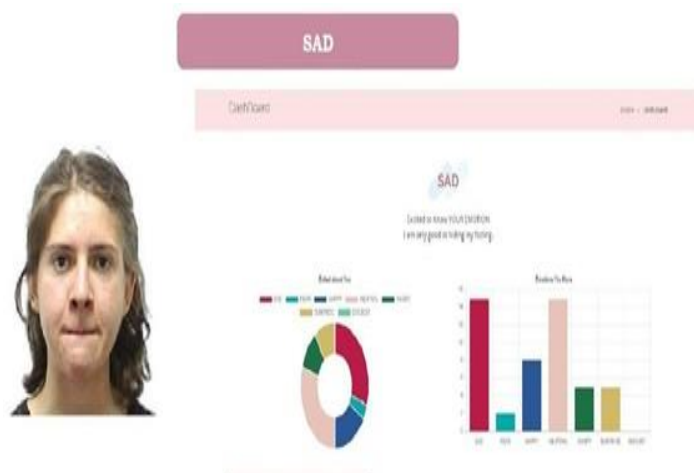
Fig. 6. Resultant of Happy Emotion Expression

Fig. 7. Resultant of Sad Emotion Expression

Fig. 8. Resultant of Fear Emotion Expression

Fig. 9. Resultant of Disgust Emotion Expression

V. FUTURE WORK AND CONCLUSION

Emotion virtual assistant is a machine that works as an assistant to drive the user throughout its software component to analyze the emotion he persist. The Emotion visual assistant act as a human computer which uses machine learning and deep learning concept to determine the current state of human feelings. The project EVA could be elongated with different more features that are converting EVA text based sentimental analysis to a actual chat oriented to know the user or it could be converted to speech based sentimental analysis. Apart from these additional features EVA in future could also be used to detect the anxiety and stress levels.

EVA future scopes are not just fixed to feature generations but its application generation. It can be integrated with the facial attendance based devices to know the stress level anxiety level or emotion as a part of attendance making it more employee friendly. It could be used in OLA, UBER etc application to identify the drivers state of driving and have a safe ride. In places where mental illness is still not considered it could be used by users to track there state and check there mental strength. It can be used in robotics to identify the prior persons senses etc. These all are just not limited and EVA at its whole have a lot more than it.

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