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EMOJI ANALYSIS WITH MACHINE LEARNING DATA FEATURES FOR FACIAL EXPRESSIONS

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ABSTRACT:

There are many different ways to express and communicate our feelings. The two classified ways of communication are verbal and non - verbal. Facial expressions are a great way of communication involving the exchange of wordless intimations. It has enticed much research attention in the field of computer vision and Artificial intelligence. Many kinds of research have been done for grouping these expressions. It is chiefly done to acquire the sentiments of humans. In this project, an API can be employed to fetch images from any camera-based application in real time. HAAR cascade classifier is employed to extract the image features from the images fetched earlier. Support Vector Machines (SVM) is used to classify those features into corresponding expressions. And these expressions are then converted to their equivalent emoji, after that these emoji, are get superimposed over the actual face expression as a mask. This project can be used to study the different facial expressions that a machine can understand and also it can be used as a filter used in social media apps like Facebook, Instagram, snapchat etc.

Keywords: SVM, HAAR, API, AI, ML.

1. INTRODUCTION:

Nonverbal behavior passes on complete feeling and passionate data, to impart thoughts, oversee connections, and disambiguate importance to enhance the effectiveness of discussions[1][2]. One method to illustrate nonverbal activates is through sending emoticon, that are practical symbols (e.g. , ,) oversaw through the Unicode Consortium which might be distinguished through unicode characters and introduced through a systems font bundle. Emoticons empower people to speak lavishly, and keeping in thoughts that are regarded as display screen designs, they may be managed as textual content

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structures. Other than Pohl's EmojiZoom[3] who endorse a zooming-based interface, getting into emoticon on cell phone consoles as of now expects customers to make a dedication from extensive records (one rundown for each class of emoticon) (e.g., Apple© iOS 10 emoticon console 2 in Fig. 1). This makes emoticon passage "a linear search task"[3] and given the developing wide variety of emoticons, we anticipate it may result in customer dissatisfaction. While no earlier work expressly addresses this, endeavors, for example, Emojipedia 3 characterize the requirement for higher emoticon search. To deal with this, we advise a framework and approach to make use of customers' facial emotional expressions as framework input to clear out emoticons with the aid of using emotional classification. In spite of the truth that emoticons can deal with activities, items, nature, and distinctive symbols, the maximum typically applied emoticons are faces with specific feelings[4][5][7]. Additionally, past work has proven that emotions may be placed through assumption (Emoji Sentiment Ranking with the aid of using Novak[6]), literary notification containing emoticons show contrasts in 3-esteemed conclusion throughout stages[8], and for faces, emoticons may be positioned through valence and arousal[7]. Momentum studies examine facilities around emotional recognition. The emotions every on-occasion ease and determine connections among the people. The putting of emotions explicitly attracts out the thoughts boggling and atypical social correspondence. Social correspondence is prominent as the judgment of the alternative people's temperament depending on the emoticon. The acknowledgment of emotions may be diagnosed via different signs by the "frame language, voice intonation" simply as through means of "extra complicated techniques, for example, electroencephalography (EEG)." Nonetheless, the much less difficult, and possible method is to investigate facial expression. By noticing the facial expression, the people's mind-set and behavior are affected. Duncan clarified that "there are seven types of human feeling [that could undoubtedly be unmistakable with an assortment of meanings] across various societies". This examination consists of discovering emotional recognition through the regular collections. The emotions are distinguished as happiness, fear, disgust, anger, sadness, surprise and contempt. This project objectives to construct a deep learning model to categorize facial expressions from the images. Then we are able to map the labeled emotion to an emoji or an avatar.

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2. LITERATURE SURVEY

Today, the most widely recognized method of communication among individuals is virtual platforms, regardless of whether utilizing the web or phones (Vissers and Stolle, 2014). The current age utilizes online applications and stages to impart and trade discussions. Be that as it may, imparting emotions is troublesome. Thus, little and straightforward pictures, also called emoticon characters, are utilized to enhance feelings when utilizing composed language (Yeole, Chavan, and Nikose, 2015). They have extraordinary semantic and passionate highlights, but on the other hand are firmly identified with marketing, law, medical care and numerous different zones. The examination on emoticons has become an interesting issue in the scholastic field, and then some and more researchers from the fields of computing, communication, marketing, behavioral science, etc are considering them. Emoticon characters are turning out to be increasingly more promoted hence the variety of these characters has expanded. Be that as it may, the current existing emoticon characters are restricted to predetermined characters. Also, these characters need intricacy and variety. To customize emoticon characters, this examination investigated techniques for clients to "emojify" their photos. This study not just permits individuals to make altered and exceptional methods of imparting emotions, yet in addition makes justification for additional upgrades of emoticon characters. It is roused by two discoveries from the literature: that an essential capacity of emoticons is to communicate emotions, and that most emoticons utilized are face emoticons. Cramer tracked down that 60% of their dissected messages by US members were emoticons utilized for communicating emotions. In an Instagram emoticon study, faces represented 6 of the main 10 emoticons utilized, giving additional proof that individuals as often as possible use emoticons to communicate emotions. Moreover, as indicated by a 2015 SwiftKey report, faces represented near 60% of emoticon use in their examination of billions of messages. At last, in a subjective report from Lee on emoji sticker utilization, they tracked down that these stickers were utilized fundamentally for communicating emotions.

Multimodal User Interfaces and Emoji Entry Identified with our methodology, Filho et al.[9] augmented text chatting in mobile phones by adding automatically identified facial expression responses utilizing computer vision methods, bringing about an emotion upgraded mobile talk. For utilizing the client's face as information, Anand et al.[10] investigated a utilization

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instance of an eBook reader application wherein the client plays out certain facial expressions normally to control the gadget. Concerning emoticon section, Pohl et al.[3] proposed another zooming keyboard for emoticon passage, EmojiZoom, where clients can see all emoticons immediately. Their strategy, which was tried in a convenience concentrate against the Google keyboard, showed 18% quicker emoticon entry. Emoji and Emoticon Communication The smallness of emoticons diminishes the exertion of contribution to communicate feelings, yet in addition serves to change message tone, increment message commitment, oversee discussions and keep up friendly connections. Additionally, emoticons don't have language obstructions, making it feasible for clients across nations and social foundations to impart. In an examination by Barbieri et al.[11], they tracked down that the general semantics of the subset of the emoticons they considered is protected across US English, UK English, Spanish, and Italian. As approval of the convenience of planning emoticons to feelings, primer examinations announced by Jaeger et al.[12] recommend that emoticons may have potential as a strategy for direct estimation of emotional relationship to food varieties and drinks.

3. METHODOLOGY

The idea of the proposed system is to employ an API that will detect the face after which the image can be processed using HAAR cascade for facial feature extraction. SVM Classifier is then used to categorize the emotions into its seven distinct types. Using HAAR of Open CV package, the corresponding emoji of the emotions can get superimposed over the subjects' faces. In any camera module of any leading social networking apps, the use of APIs can reduce the processing time for face detection for which they have their in-built face detection algorithm which can detect the face smoothly and followed by which the emoticons can be implemented over the faces as filters. However, this simple fast and playful rating system should give a wider range of opinions about the experiences of the customers with the restaurant concept. Last but not the least, human expressive behaviors in realistic applications involve encoding from different perspectives, and the facial expression is only one modality.

Although pure expression recognition based on visible face images can achieve promising results, incorporating with other models into a high-level framework can provide complementary information and further enhance

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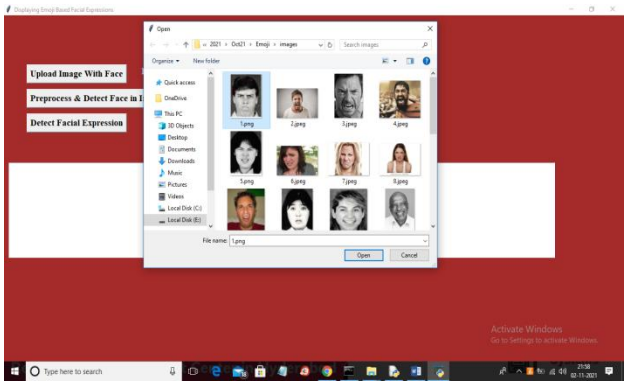
the robustness. For example, participants in the Emoji challenges and Audio Video Emotion Challenges (AVEC) [252], [253] considered the audio model to be the second most important element and employed various fusion techniques for multimodal affect recognition. Additionally, the fusion of other modalities, such as infrared images, depth information from 3D face models and physiological data, is becoming a promising research direction due to the large complementarily for facial expression.

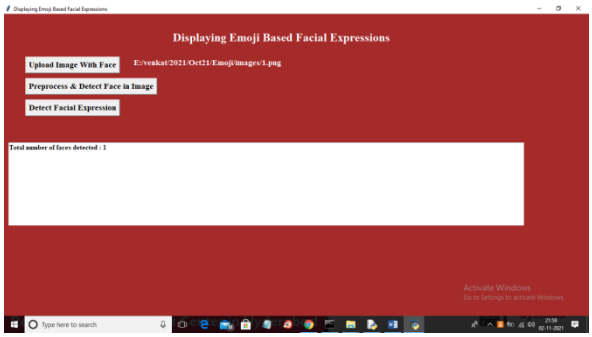


Output Screen -2

In above screen selecting and uploading '1.png' file and then click on 'Open' button to load image and to get below output

Output Screen-3

In above screen image is loaded and now click on 'Preprocess & Detect Face in Image' button to check whether image contains human face or not



Output Screen-4

In above screen in text are we can see one face is detected and now click on 'Detect Facial Expression' button to detect facial expression and to get below output.

Output Screen -5

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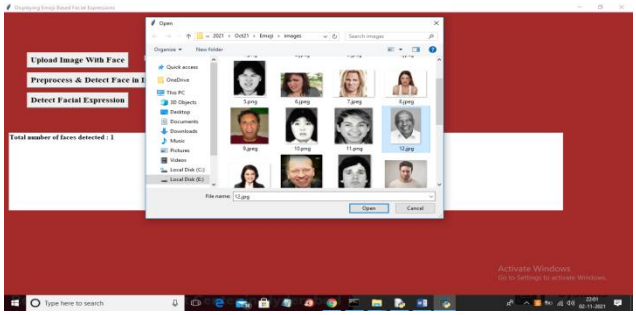
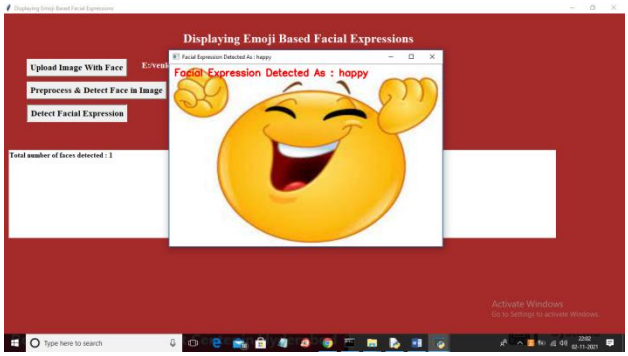
In above screen in uploaded image expression detected as ANGRY and then ANGRY Emoji is displayed and below is the other output



Output Screen-6

In above screen uploading 12.jpg file and then preprocess image and then click on 'Detect Facial Expression' button to get below output



output screen-7

CONCLUSION

In this paper, Computer Vision has been used for the recognition of facial emotion and converting those emotions into their corresponding emoticons.

Object face is detected using any camera-based API. The Features of the expressions of the detected face will be extracted using HAAR cascade that will supply the feature extractions of the expressions depicted in the image for further classification into seven emotions by employing Support Vector Machines (SVM) that exhibits a good accuracy value as compared to the other existing algorithms.

This proposed model can be used by the leading social networking handlers like Facebook, Instagram, Snapchat for their camera-based applications involving various effects and filters.

There are many existing face-detecting neural networks that have good efficiency but their implementation may be difficult in some cases.

Through our approach of using APIs instead of neural networks, we can make the implementation convenient.

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