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Showing Facial Expressions Based On Emojis

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ABSTRACT— An emoji is a visual representation of a vocal message. Online chats, product reviews, brand sentiment, and more all rely on these indications. Adding emoji-driven liar data exploration is also a result. Machine learning & computational intelligence developments have made it possible to recognise facial expressions in photographs. Facial expressions influence interpersonal relationships because they carry language cues. In human-machine interactions, the ability to recognise human facial expressions automatically can be useful, and it can also be applied to behavioural wisdom. For humans, discovering emotions in facial gestures has always been simple, but doing so with a predictive algorithm is more challenging. Machine learning developments have made it possible to identify human emotions based on facial expressions. Emojis will be mapped to human facial emotions using this deep learning approach. Human facial expressions are used as input device to recognise and map emoji expressions. However, while emojis may represent a variety of different things like actions or objects or even elements of nature, faces are by far the most commonly used emojis for conveying emotion.

Index Terms— Representation of emoji characters in the face of a Convolution Neural Network (CNN).

I. INTRODUCTION

There are several ways nonverbal behaviour can be used to convey information that is both eloquently conveyed and eloquently conveyed.[1] Sending emoticons, which are practical symbols (e.g.,,) governed by the Unicode Consortium and distinguishable using hexadecimal symbols and implemented through with an Unicode font package, is one way to demonstrate nonverbal activity.

Emoticons give people the ability to express themselves freely, and because of their status as screen designs, they can be treated as text structures. If you want to use emoticons on your phone, you'll need to dig through large records (one for each type of emoticon) unless you're using Pohl's EmojiZoom[3], which promotes a zooming interface (see, for example, Apple's iOS 10 emojis terminal 2). A linear search effort for emoticons may lead to user frustration because of the increasing variety of emoticons. While no previous work specifically tackles this, Emojipedia 3 characterises the need for a more comprehensive emoticon search.

Using facial expressions as framework input, we recommend a framework and approach for removing emoticons using emotional categorization to address this issue. Many people use emoticons to express a wide range of emotions, however the most commonly used emoticon were characters with specific feelings[4][5]. Emoji Sentiment Ranking utilising Novak [6] has shown that emotions may be placed by assumption, literary notifications with emoticons show disparities in 3-esteemed conclusions through stages [8], and for face, emojis can be placed using intensity and arousal [7].

Momentum studies focus on capacities for recognising and responding to emotional stimuli. People's relationships are shaped by the emotions they feel on a regular basis. Explicitly expressing one's emotions draws forth the mind-bending and unusual social correspondence. An important aspect of social correspondence is the use of emoticons to assess a person's temperament. Different indications, such as "framing language, vocal intonation," as well as "additional sophisticated procedures, for example, electroencephalography (EEG)" may be used to diagnose the acknowledgment of emotions.

Nevertheless, studying facial expressions is a far simpler and more practical approach. It is possible to influence people's attitudes and behaviours simply by observing their facial expressions. There are "seven forms of human sensation [that could surely be recognised with an arrangement of meaning] throughout different nations," Duncan explained.

The goal of this analysis is to identify instances of emotional recognition in the data collected as part of routine operations. Happiness, fear, disgust, rage, sadness, surprise, and disdain are some of the most common emotions.

The goal of this project is to build a deep learning model that can recognise and categorise face emotions. We can then use an emoji or an avatar to represent the labelled emotion.

II. RELATED WORK

Deep Learning Emoji Retrieval Based on Emotion Recognition

Emotions are communicated through our facial expressions, which are a form of vocal conversation. The ability to recognise emotions in facial expressions is critical in a wide range of fields, including psychology, linguistics, and others. The image identification of face expressions is therefore a must for generation in the realms of automation and artificial intelligence [11]. Human-machine communication relies heavily on emotion recognition. Pre-processing, image recognition, extraction and classification, and classification are common steps in emotional recognition. Anger, disgust, fear, pleasure, sorrow, surprise, and neutrality are the seven most common human emotions that may be identified via deep learning.

Analysis of emoji sentiments using KNN

In today's environment, we get a slew of comments on social media about just about everything every minute. Emojis are a popular alternative to text when expressing our emotions. Just the emojis used throughout the comments are taken into account for analysing [3] the sentiment in this piece. An emoji expression identification system developed by us is capable of detecting expressions such as sarcasm and despair. The KNN method is used to recognise emojis by extracting features from the image. Emojis are detected, and the facial landmarks extraction procedure recovers the specified facial landmarks that are employed by the algorithm, as shown in the figure. We make advantage of Twitter's data. Using this strategy, 80% of smiles, 72% of rage, and 66% of sadness were accomplished.

With minimal data and the order of the training samples, facial emotion identification using convolutional neural networks copes

Animated avatars, neuromarketing, and social robots are just a few of the new uses for facial expression detection that have emerged in the last decade of study. In order to recognize facial expressions, machine learning systems have to deal with a wide range of people's expressions. Different subjects can bring out the differences in lighting, background, and position in even the same person's portraits in the same facial expression (because of variations in shape, ethnicity among others). Only a few studies have attempted to conduct a fair evaluation without mixing up the individuals while developing the proposed methodology for facial emotion recognition. Thus, facial expression recognition in computer vision remains a difficult topic. Using a mixture of Convolutional Neural Networks and image pre-processing [10], we present a simple approach for facial expression recognition. Big data improves the accuracy of Convolutional Neural Networks. Furthermore, there have been no public information datasets with enough data for deep structures to recognize facial expressions. Because of this, we use pre-processing methods to extract only the elements of a face image that are distinctive to its expression, and then we experiment with the set of standardized of the images during training. Three widely utilized public databases (CK+, JAFFE, and BU-3DFE) were used to conduct the tests that evaluated our method. The predictive performance is examined in relation to the influence of every image preprocessing step. The suggested method has a 96.76 percent accuracy rate in the CK+ database, is fast and easy to implement, and can recognize real-time facial expressions on a conventional computer with no additional hardware.

Support Vector Machine for Recognizing Emotions

It is the purpose of this research to apply Support Vector Machines to the challenge of categorizing emotions on photographs of human faces. The natural variety in people's appearances [13] complicates this well-defined

problem, necessitating a classification system that can separate the few essential traits from the vast input data. Recent neural network experiments have yielded a classification accuracy of more than 85%. As a result of these tests, it may be determined whether or not the Support Vector Machine approach is as effective as neural networks.

III. METHODOLOGY

Humans use their facial expressions to communicate their feelings to one another. Automated face expression profile is a hot topic because of the variety of applications it offers in fields like robotics, healthcare and driving systems and methods. Using the seven expressions from the 20th century, Ekman et al. defined seven fundamental emotions that are independent of a person's upbringing and society (anger, fear, happiness, sadness, contempt, disgust, and surprise). Sajid et al. discovered that facial asymmetry can be used as an indicator of prediction in latest research mostly on face - recognition data set. [5] According to their findings, the asymmetry on the right image is preferable to that on the left. The aspect of the forehead is usually a major issue when it comes to identifying a person's identity. Face posture variability can be alleviated using Ratal and other methods. They employed a topic-specific descriptor-based invariant three-dimensional positioning technique. Using convolutional networks, a variety of issues, such as excessive makeup and expression, can be remedied. Research in the subject of facial expression has recently produced amazing advances in the detection of facial expressions, which has aided in the advancement of neurobiology and cognition science. In addition, advances in machine learning and artificial intelligence have made it possible for the general public to more precisely and accurately identify emotions. The human face detection expressions as a thread of photo editing has grown fast in recent years.

Face Detection, Face Recognition, and Face Classification are all part of the proposed system. In the first stage, a video camera records a live human face and uses bounding box coordinates [9]to pinpoint its exact location. Haar cascade detection and the open CV library are used to identify faces. Shapes, objects, and landscapes can all be seen in the photographs. In this step, a human face is recognised and face features are retrieved and stored in database for recognition. Use the CNN model to identify human emotions [10]. Facial features are compared to those in the database to help determine whether or not an image has a certain person's face. To begin, the detection is done and then matched to a database using CNN model train and test. Final classifications are anger, fear, disgust, happiness, neutrality, and surprise depending on the current expression of the recognised human face.

Three phases are involved in the process. Pre-processing is the process of transforming a database into a form that can be used by a general algorithm and produce useful results with minimal effort. Real-time photos are used to identify a person's face at the face detection stage. The CNN algorithm is used to classify a photo into each of 7 different emotional categories.

Using facial expression detection from photos, we are then showing emojis to the user based on their expression. The following modules have been developed in order to carry out this project:

Upload Image With Face: We'll use this module to upload pictures.

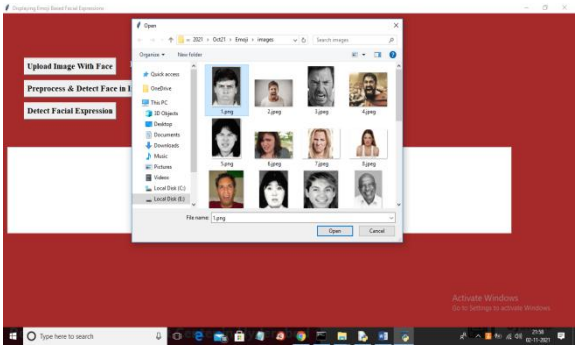
Pre-process & Detect Face in Image: Pre-processing an image using this module will seek for the presence of a human face, and only then will it be able to forecast the expression on the subject's face.

Detect Facial Expression: When this module detects a face, it will make a facial expression prediction, and emoji will be presented depending on that prediction.

IV. RESULT AND DISCUSSION

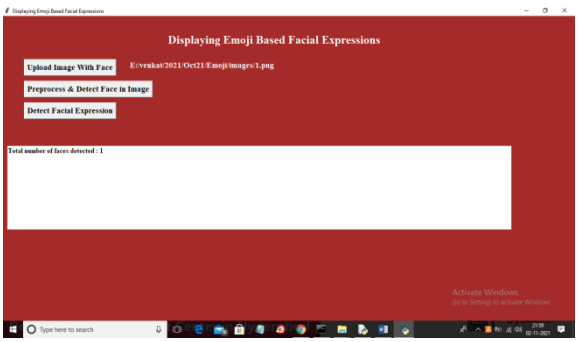
To run the project to get below result

Then, to upload an image, select the Upload Image with Face tab



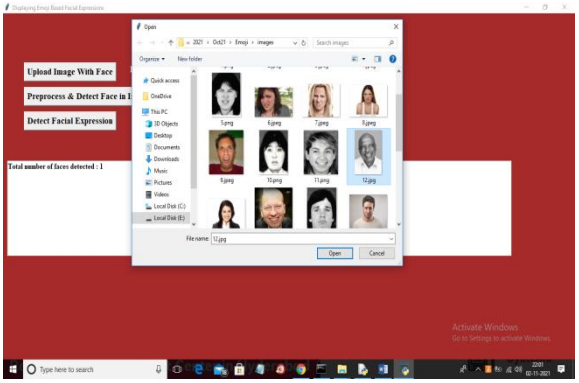
You may see this by selecting and uploading a 1.png file, then clicking the open option.

In the above output image, a human face can be detected by clicking on the button labelled Pre-process & Detect Face in Image.

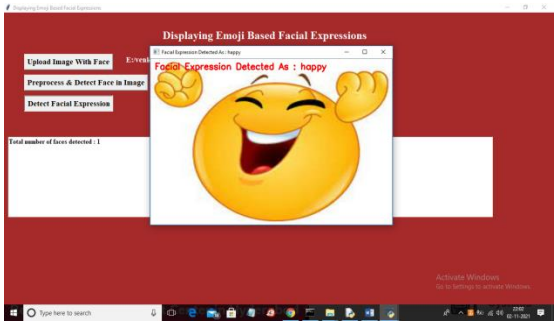


If you look at the text above, you'll notice that one face has been detected. Clicking the button labelled "Detect Facial Expression" will yield the results shown below.

When an image is uploaded with an ANGRY expression, the ANGRY Emoji is displayed, while the other output is shown below.



The output shown below was obtained by first uploading the 12.jpg image file, pre-processing it, and then clicking the 'Detect Facial Expression' button.



The HAPPY EMOJI shown in the above result is based on the facial emotion recognised as HAPPY. The same may be said when uploading and testing other photographs.

V. CONCLUSION

Emojis are a way to represent nonverbal signs in communications. In online chat, product evaluation, logo emotion, and a slew of other contexts, these indicators have become essential. It also sparked an increase in the number of computer science studies focusing on emoji-driven narrative. Emotional popularity can be determined by comparing the popularity of a photograph to a convolutional neural community structure. In addition, advances in machine learning have made it possible to detect human emotions in images. [9] The goal of this project is to identify and map the emojis associated with various human facial emotions. Nonverbal cues can be represented with emojis. In online chat, product evaluation, logo emotion, and a slew of other contexts, these indicators have become essential. It also sparked an increase in the number of computer science studies [7] focusing on emoji-driven narrative. A convolutional neural network structure is used to build and train a model on the Proactive approaches datasets for emotion detection from images, as well as advances in computer vision and deep learning. The facial expressions of humans can be classified in this study so that the related emojis can be identified and mapped.

VI. REFERENCES

[1] A. T. Lopes, E. de Aguiar, A. F. De Souza and T. Oliveira-Santos, "Facial expression recognition with convolutional neural networks: coping with few data and the training sample order", Pattern Recognition, vol. 61, pp. 610-628, 2017

[2] B. G. Priya, "Emoji based sentiment analysis using KNN", International Journal of Scientific Research and Review, vol. 7, no. 4, pp. 859-865, 2019.

[3] S Srivastava, P Gupta, P Kumar "Emotion Recognition Based Emoji Retrieval Using Deep Learning" 2021 - ieeexplore.ieee.org

[4] Dataset is taken from https://www.kaggle.com/fer2013

[5] (Burgoon, J., Guerrero, L., Floyd, K., (2010). Nonverbal Communication, Taylor & Francis. p.3)

[6] Carton, J.S., Kessler, E.A., Pape, C.L.: Nonverbal decoding skills and relationship well-being in adults. J. Nonverbal Behav. 23(1), 91–100 (1999)

[7] Izard, C.E.: Human Emotions. Springer, New York (2013)

[8] Lewine, Donald A. (1991). POSIX Programmer's Guide (PDF). O'Reilly & Associates, Inc. p. 1. Retrieved 2 August 2016.

[9] Clarke, Steven (2004). "Measuring API Usability". Dr. Dobb's. Retrieved 29 July 2016.

[10] T. Kanade, J. F. Cohn, and Y. Tian, “Comprehensive database for facial expression analysis,” in Automatic Face and Gesture Recognition, 2000. Proceedings. Fourth IEEE International Conference on, pp. 46–53, 2000

[11] M. Lyons, S. Akamatsu, M. Kamachi, and J. Gyoba, “Coding facial expressions with gabor wavelets,” in Automatic Face and Gesture Recognition, 1998. Proceedings. Third IEEE International Conference on, pp. 200–205, Apr 1998.

[12] Rekha N., Dr. M. Z. Kurian, " Face Detection in Real Time Based on HOG," in International Journal of Advanced Research in Computer Engineering and Technology (IJARCET) Volume 3 Issue 4, April 2014.

[13] Emotion Expression Recognition using Support Vector Machine, Melanie Dumas Department of Computer Science University of California, San Diego La Jolia, CA 92193-01.