

SENTIMENTAL ANALYSIS

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ABSTRACT

The sentimental analysis is a process of extracting human feelings from data. It is an application of natural language processing, computational linguistics, text analysis. Its basic idea is to classify human emotions in different moods such as happy, sad, neutral, etc. Thus, the ultimate goal of sentiment analysis is to decipher the underlying mood, emotion, or sentiment of a text. It uses the pattern of movement of both the lips and the eye shape that it takes during different feelings of human. It has a huge variety of applications because of its ability to extract insights from data sets and the social media. Few applications of Sentiment Analysis are Market analysis, Social media monitoring, Customer feedback analysis, Human feelings detection, Emotion detection, etc. In this age when users can express their viewpoints effortlessly and data is generated in superfluity in just fractions of seconds, drawing insights from such data is vital for organizations to make efficient decisions, and Sentiment Analysis proves to be the missing piece of the puzzle!

1. Introduction

Emotion Detection is a use case of **Natural Language Processing (NLP)** and comes under the category of **text classification**. It is a process of extracting human feelings from data. It is an application of computational linguistics, text analysis, etc. To put it simply, Sentiment Analysis involves classifying a text into various sentiments, such as positive or negative, Happy, Sad or Neutral, etc. It uses the pattern of movement of both the lips and the eye shape that it takes during different feelings of human[2].

On a day to day basics humans commonly recognize emotions by characteristic features, displayed as a part of a facial expression. For instance happiness is undeniably associated with a smile or an upward movement of the corners of the lips. Similarly other emotions are characterized by other deformations typical to a particular expression. Research into automatic recognition of facial expressions addresses the problems surrounding the representation and categorization of static or dynamic characteristics of these deformations of face pigmentation [8]. The system classifies facial expression of the same person into the basic emotions namely anger, disgust, fear, happiness, sadness and surprise. The main purpose of this system is efficient interaction between human beings and machines using eye gaze, facial expressions, cognitive modeling etc. Here, detection and classification of facial[3].

Thus, the ultimate goal of sentiment analysis is to decipher the underlying mood, emotion, or sentiment of a text. It has a huge variety of applications because of its ability to extract insights from data sets and the social media. Some use cases of sentiment analysis are **Social Media Monitoring for Brand Management, Product/Service Analysis, Stock Price Prediction, etc.** Hence, facial expressions are important in facilitating human communication and interactions. Also, they are used as an important tool in behavioral studies and in medical rehabilitation. Facial image based mood detection techniques may provide a fast practical approach for non-invasive mood detection. Thus, the application provides the facility to generate various emojis with different emotions. One should not worry about maintaining a large number of images; the application is going to take care of all these[1].

1.1 Applications of Emotion Detection

Machine learning-based facial expression recognition finds extensive applications, and we have

discussed a few of them below. Facial Expression Recognition Technology is used for medical research in autism therapy and deepfake detection. FER technology can be leveraged to ensure safe driving on roads. So, if a driver is feeling drowsy and is about to faint, the ride-hailing service can deploy a system to raise the alarm after reading their facial expressions. The facial emotion recognition project solution codes are widely used to automate clicking selfies. An individual must look at the camera with beautiful smiles, and the device will click the image without any external push. Another everyday use case is for businesses. They can use this technology to analyze the feedback emotions of their customers for their service. They can leverage that information to plan their next course of action in upscaling their business growth. For example, serving a sad customer can be prioritized. Such interesting applications have made facial expression recognition a hot research topic among deep learning engineers. Let us explore what models they are using to build the Facial Emotion Recognition Project

2. LITERATURE SURVEY

In paper [1] authors proposed we use the machine learning (ML) open library “Keras” provided by Google for facial emotion detection. We used two different datasets and trained with our proposed network and evaluate its validation accuracy and loss accuracy. Images extracted from given dataset which have facial expressions for six emotions, and we detected expressions by means of an emotion model.

It needs large amounts of training data. In addition, the choice of images used for the training is responsible for a large part of the eventual model’s performance. It means the need for a data set that is both high quality and quantitative. Several datasets are available for research to recognize emotions, ranging from a few hundred high resolution photos to tens of thousands of smaller images. In emotion detection we are using three steps, i.e., face detection, features extraction and emotion classification using deep learning with our proposed model which gives better result than previous model. In the proposed method, computation time reduces, validation accuracy increases and loss also decreases, and further performance evaluation achieved which compares our model with previous existing model. We tested our neural network architectures on FER-2013 and JAFFE database which contains six primary emotions like sad, fear, happiness, angry, neutral, surprised, disgust[1].

In paper [2] authors proposed the article introduced here has mainly concentrated on the creation of smart framework with the inherent capabilities of drawing the inference for emotion detection from facial expressions. Recently, the notion of emotion recognition is attaining mostly the researcher's mind in the area of exploration on smart system and interaction between human and computer. Based on facial attributes the facial expression recognition can be classified one of the six well known fundamental emotions: sadness, disgust, happiness, angry, neutral[2].

3. PROBLEM STATEMENT, OBJECTIVES AND PROPOSED WORK

3.1 Problem Statement

This project is based on the main advantages and convenience of Python programs and summarizes the algorithm advantages of researchers in emotion detection in the literature in this field. According to the unique concept of this project, system function analysis, environment construction, model diagram setting, sample data, and training are carried out. Multiple steps such as set testing and algorithm execution are used to judge emotions in face images

3.2 Objectives

To develop a facial expression recognition system

To experiment machine learning algorithm in computer vision fields

To detect emotions thus facilitating Intelligent Human-Computer Interaction.

3.3 Proposed Work

The fundamental of this face recognition is important for the interpretation of facial expressions in applications such as intelligent, man-machine interface and communication, intelligent visual surveillance, teleconference and real-time animation from live motion images. The facial expressions are useful for efficient interaction Most research and system in facial expression recognition are limited to six basic expressions (joy, sad, anger, disgust, surprise). It is found that it is insufficient to describe all facial expressions and these expressions are categorized based on facial actions . Detecting face and recognizing the facial expression is a very complicated task when it is a vital to pay attention to primary components like: face configuration, orientation, location where the face is set.

4. Design and implementation

4.1 System Design

In our emotion detection in python project we have proposed different modules such as happy,fear,surprise,neutral,etc. In training dataset, we have proposed different modules such as face detection – inthis module, we collect different human face images which have different emotions.

Face extraction – It is the process of transforming raw data into numerical features. Learning Model - A file that has been trained to recognize certain types of pattern. The training datasets when passed through Prediction Labels gives classification. In testing datasets we can detect the emotions through camera, image or video. In our project we have introduced face detection via. Camera. In this, the camera first detects our face and extracts the feature of face through LBP. Then it classifies different

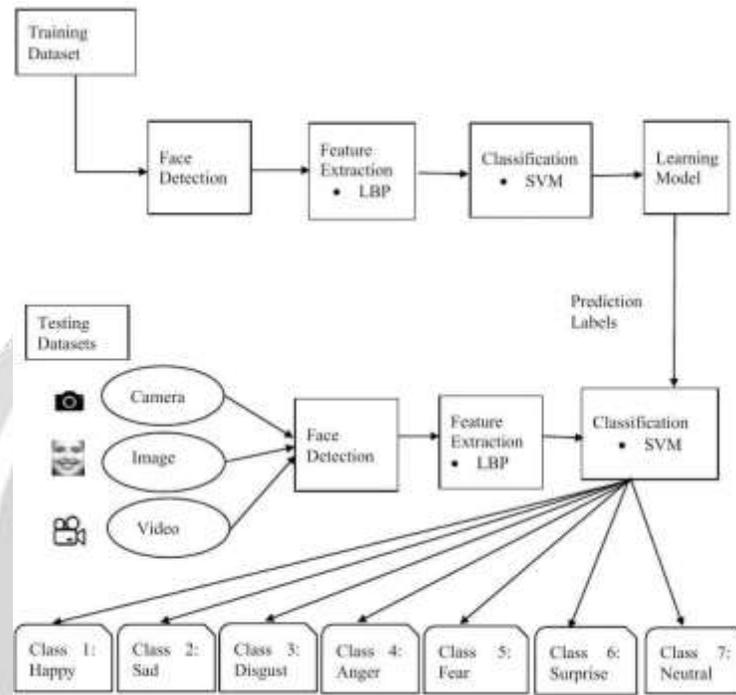
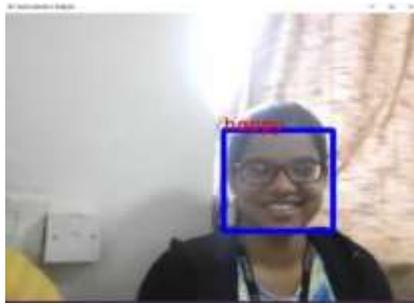


Figure1:System
Diagramemotion.

5. Result Analysis

From this project we have come to the conclusion that the system we are using to determine the sentiments of the targeted object is executing successfully but working in different modules. The bottleneck of the process is our hardware that cannot be used to train the large number of images because of its high demand of processors, slow performance on the processor and not availability of adequate graphics processing unit (GPU)[3]. The identification module can generate data-set and be trained on its own to identify any character with adequate accuracy. The detection module detects the emotion of the characters with adequate accuracy due to its bottleneck. But both of them executes well on their own. For determining emotion or the present state of the character only expression of face will not provide the accurate result but we have to also include the voice patterns, its pitch and amplitude, the language used and the tone of the speaker with the context. For determining these it needs the ability of speech analysis, natural language processing (NLP) and may other deep learning fields[2]. This also needs high end server hardware for its implementation.



g: Happy



Fig: Neutral

Image 1 detects happy emotion.
Image2detects neutral emotion.

6. CONCLUSION

In this project we have done emotion detection using facial recognition on Human face. Sentimental analysis has varying applications like security, to know about the mindset of an employee, mindset or state of patients and for the investigative purposes. It can be used in different types of examination purposes. While it may seem like a complicated process, sentiment analysis is actually fairly straightforward – and there are plenty of online tools available to help you get started. By now we have covered in great detail what exactly sentiment analysis entails and the various methods one can use to perform it in Python.

7. REFERENCES

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