STRESS DETECTION IN WORKING EMPLOYEES BY USING IMAGE PROCESSING AND MACHINE LEARNING

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Abstract: Every part of a person's existence is encircled by his or her personality. It defines the pattern of thinking, feeling, and qualities that predict and describe an individual's behavior, as well as how emotions, preferences, motives, and health affect daily living activities. The growing popularity of social networking sites like Twitter and Facebook has prompted the online community to communicate ideas, sentiments, opinions, and emotions with one another, reflecting their attitude and behaviour. Obviously, a solid connection exists between individual's temperament and the behavior they show on social networks in the form of comments or tweets. Nowadays personality recognition from question and answer and by face emotions has attracted the attention of researchers for developing automatic personality recognition systems. The core philosophy of such applications is based on the different personality models, like Big Five Factor Personality Model.
contains**.**

Index Terms **– emotions, personality recognition systems, Big Five Factor Personality Model**

I. INTRODUCTION

As the world is becoming more modern and digital, human-computer interaction is a very intriguing and well-known subject of research these days. This necessitates those digital systems accurately mimic human behavior. Emotion is a unique aspect of human behavior that plays an essential role when communicating with computers. In order to construct really intelligent behavior, computer interfaces must be able to recognize the emotion of the users.

II. METHODOLOGY

People have started working from home in today's society, and as a result, company managers and HR are unable to determine whether the working atmosphere is psychologically healthy or not. This can be accomplished by forecasting employee personality.

III. OBJECTIVE

Due to work home anywhere culture employee are not been interacting with each other physically.

This has led unidentified depression in employee. System which are developed earlier will take online text input.

We are incorporating both text as well as face input

IV. SCOPE

- User can register with personal information
- User should provide login information
- User should select profession
- User should give answer to the question
- Auto Face will be detected and depression on facial expression and text will be calculated

V. SVM

Support Vector Machine or SVM is one of the most popular Supervised Learning algorithms, which is used for Classification as well as Regression problems. However, primarily, it is used for Classification problems in Machine Learning.

The goal of the SVM algorithm is to create the best line or decision boundary that can segregate n-dimensional space into classes so that we can easily put the new data point in the correct category in the future. This best decision boundary is called a hyperplane.

SVM chooses the extreme points/vectors that help in creating the hyperplane. These extreme cases are called as support vectors, and hence algorithm is termed as Support Vector Machine. Consider the below diagram in which there are two different categories that are classified using a decision boundary or hyperplane.

VI. PROJECT GOAL:

The goal of this project is to classify a user's personality qualities from input text using a supervised machine learning approach called SVM classifier on a personality benchmark dataset. It will also the take the input of the user face and will tell the personality based on the face recognition.

VII. LITERATURER REVIEW

Mohammad Hossein Amirhosseini et al. [1] derived that NLP can be used to detect patterns in people's behaviour. NLP (Neuro Linguistic Programming) is a set of approaches that can be used to figure out how people think and interact. There are variety of methods for predicting personalities based on meta-programs, out of which the Myers–Briggs Type Indicator(MBTI) is widely used. Author developed new ML method based on MBTI for personality prediction which certainly improved the accuracy of recognising above personalities, sensing and Introversion, Extroversion personality categories as well as improvement in accuracy for the Judging ,Perceiving personality category which is useful to easily assist NLP practitioners and psychologists in identifying personality kinds. Alam Sher Khan et al. [2] explored the use of an online text for Personality Classification using a machine learning approach. KNN, Decision Tree, Random Forest, MLP, Logistic Regression (LR), MNB, and Stochastic Gradient Descent (SGD) were used to forecast various machine learning techniques. The finding suggests that the scores obtained by all classifiers across all personality traits are suitable. The KNN classifier, on the other hand, had a lesser overall performance. The paper's drawback is that they did not experiment with personality based on data in the form of pictures and videos.

This paper was written by Aliaa A. A. Youssif, Wesam A. A. Asker which presents a computer vision system for automatic facial expression recognition (AFER). There are three major steps in AFER, the first step being the detection of the face in the scene. The second step is to extract the facial features that showing the facial expression and the third step is to classify the facial display shown on the face. The face detection uses the open source code library (OpenCV) that employs a face detection algorithm based on Viola & Jones features. Then, the Facial Features Extraction is done where the segmentation process is performed first to divide the face image into three areas: mouth, nose and two eyes and two eyebrows. Second, the facial characteristic points (FCPs) are in each face component using mouth, nose, eyes and eyebrows FCPs extraction techniques. The feature extraction process is applied to face image to produce a feature vector that consists of two types of features: geometric features and appearance features which shows a pattern for facial expression classes. After this, the feature vector is given as an input into the radial basis function artificial neural network to recognize the facial expressions The results show that the AFER system classifies the facial expressions accurately with recognition rates between 90% and 99% in a person dependent dataset and between 83% and 100% in a person- independent dataset.[1]

The authors Enrique Correa, Arnoud Jonker, Michael Ozo and Rob Stolk proposed their paper of emotion recognition using Convolutional Neural Network. This method includes a few hundred high resolution photos to tens of thousands smaller images. In order to increase the accuracy of the emotions detected the size of the training dataset must be increased from 9000 images to 20000 images from FERC. The results obtained are compared with other methods such as SVM and LVQ. It produces an accuracy of 90% happy,80% neutral and 77% surprised. [2]

The authors Kartika Candra Kirana, Slamet Wibawanto and, Heru Wahyu Herwanto, in their paper proposed emotion detection using Viola Jones Algorithm. Though Viola Jones is commonly used for face detection, here Viola Jones algorithm is used for both face detection and emotion recognition. Rectangular feature and cascading AdaBoost algorithm are applied as the main concept of the Viola-Jones Algorithm in both the processes. These processes use Russel's Circumplex to classify the emotions as this has a better efficiency in classifying the emotions. This method consists of 3 stages: initially an image is captured from a video; the unwanted rectangular areas are deleted and then the emotion in the picture is recognized. The prediction provided an accuracy of 74%.

[3] The authors Aafiya Shaikh, Dipti More, Ruchika Puttoo, Sayli Shrivastav proposed a model of chatbot which works as an android application. The user has to login to the application using email and a password. The details are being used for user authentication purpose. Once the user logs in, the real processing of the data takes place on the server. The input is taken from the user, sent it to the server for processing using Recurrent Neural Network (RNN). RNN uses encoding and decoding mechanism for implementing a chatbot. The architecture is an end to end mechanism and based on that a decoder is being built. The attention mechanism is also implemented where it the essential characteristics of the sentences are being extracted.[4]

VIII .SYSTEM ARCHITECTURE:

The figure above depicts the project's system architecture as well as the system's flow. First, the input is taken as text and preprocessing is applied to it. With the help of dictionary, a feature vector is extracted from that text. After that, an image is taken with the help of a camera feed, and a personality analysis is performed.
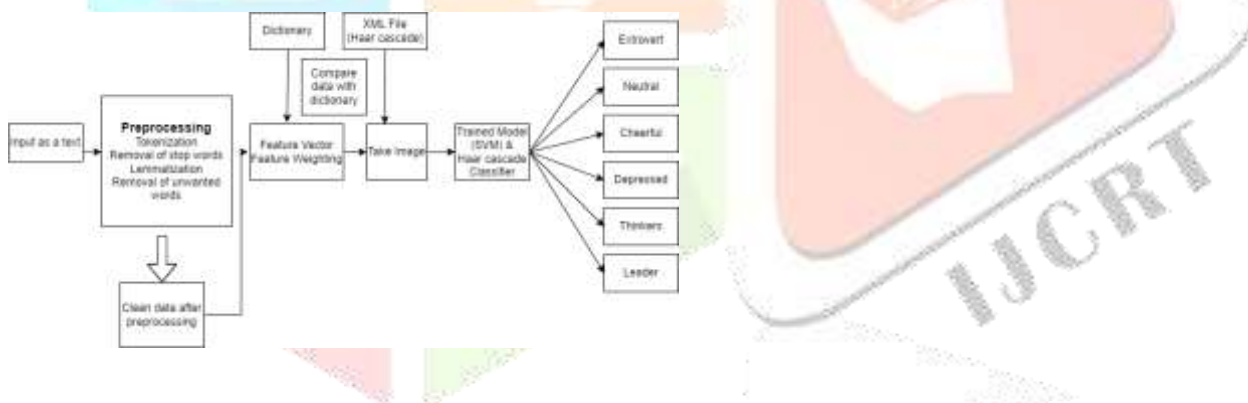

Fig 1. System Architecture

IX. CONCLUSION

This project can be used to estimate an employee's personality by using text responses as input and applying the SVM algorithm. In addition, the user can submit a photograph for an overall personality analysis and based on the result the user can improve himself.

X. Future Scope:

1. We will add feature which can also tell personality of user based on the text written on paper.

2. Android app can also be developed which can help the easy access.

3. This project can be used in an organisation to detect is employees are in stress or happy with the work also it can be used in colleges to know the personality of students.

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