

Tensorflow Based Automatic Personality Recognition Based On Facial, Tone and Resume Analysis

Divya Gharaniye Tejasvini Kale Gauri Suryavanshi Prof. Sanjay Jadhav

Dept. of Computer Engineering
Smt. Indira Gandhi College of Engineering
Navi Mumbai, India

divyagharaniye@gmail.com, Kaletejasvini99@gmail.com, gsuryavanshi99@gmail.com, sanjayjadhav@sigce.edu.in

Abstract - With the development of artificial intelligence (AI), the automatic analysis of video interviews to recognize individual personality traits has become an active area of research and has applications in personality computing, human-computer interaction, and psychological assessment. Machine learning techniques have led to the establishment of convolutional neural network (CNN) models that can successfully recognize human their personality traits with the use of a camera. In this an end-to-end AI interviewing system was developed using asynchronous video interview (AVI) processing and a TensorFlow AI engine to perform automatic personality recognition (APR) based on the features extracted from the AVIs and the true personality scores from the facial expressions. The main task of this study is to predict the big-five traits personality dimensions from video images by using machine learning techniques and artificial neural networks. In this study, video images and the emotional states of the person obtained from videos were utilized and an artificial intelligence based system was developed to be able to predict automatically the personality traits of a person from videos.

keywords- Resume, analysis, Tensorflow, personality recognition.

I.INTRODUCTION

Industrial and organizational (I/O) psychologists have found that personality is a global predictor used in employment selection. Some employers use self-reported surveys to measure job applicants' personalities; however, job applicants may lie when self-reporting personality traits to gain more job opportunities. Some employers evaluate the applicants' personalities from their facial expressions and other nonverbal cues during job interviews because applicants have considerable difficulty faking nonverbal cues.

However, it is not practical for every job applicant to attend a live job interview in person or participate in interviews conducted through telephone calls or web conferences due to the cost and time limitations. One-way asynchronous video interview (AVI) software can be used to automatically interview job applicants at one point in time. This approach allows employers to review the audio-visual records at a later point in time. When using AVI, human raters find it cognitively challenging to correctly assess applicants' personality traits based on video images. Barrick et al found that human raters were unable to accurately assess an applicant's personality simply by watching recorded-video interviews. Both I/O psychology and computer science scholars have suggested that artificial intelligence (AI) may surpass humans in recognizing or predicting an applicant's personality for

screening job applicants because applying AI techniques to audio-visual datasets can achieve more reliable and predictive power than human raters. "AI is a branch of computer science that seeks to produce intelligent machines that respond in a manner similar to human intelligence", and it "aims to extend and augment human capacity and efficiency of mankind in tasks of remaking nature". Machine learning (ML) is a major approach for achieving AI, which "gives computers the ability to learn without being explicitly programmed". Deep learning (DL) is a technique to implement ML, and it can "mimic the human brain mechanism to interpret data such as images, sounds and texts". In contrast to traditional ML, DL feature extraction is automated rather than manual.

ML/DL can be divided into supervised learning, unsupervised learning, and semi-supervised learning. Supervised learning tasks are commonly conducted by classification using predefined labeled training data (called "ground truth"), whereas unsupervised learning can automatically learn the correct answers from a large amount of data without requiring predefined labels. Semi-supervised learning combines those two approaches by using relatively smaller amounts of unlabeled data plus some labeled data for pattern recognition; therefore, this approach can reduce labeling efforts yet still achieve high accuracy.

Previous automatic personality recognition (APR) studies were developed based on supervised ML, which involves

manual labelling work and is time consuming. Because convolutional neural networks (CNNs) have been proven to be high-performing models that can automatically process images and infer first impressions from camera images, this study implemented semi-supervised DL methods, including CNNs, to develop an AI-based interview agent that can automatically recognize a job applicant's personality by using relatively smaller datasets of the applicants' facial expressions.

Scope of the Project

As we know Indian I.T sector is second largest candidate recruiting sector of our country. It contribute about 7.5% to our Gross Domestic Product(G.D.P) Our Proposed system is initially concerned with the I.T sector of our country. It is mainly going to deal the Indian I.T industry but if you talk about the pro version of our system it can be extended to various other commercial sector where, intake and elimination are in bulk like for GovernmentalJobs. Skills and the personality are most vital factors in the organization about employee which is very useful for improve the performance of the company. So, scope of this project is very useful for HR department in the organization do analyze the emotions on the face in video interviews which will analyze the system.

Problem Statement

Interpersonal communication skills and personality traits have been identified as critical success factors for job performance and organization effectiveness. Communication skills enable workplace members to effectively exchange, share, and feedback information to different stakeholders through verbal and nonverbal messages.

Verbal messages are used to convey exact words, and nonverbal messages, such as gestures, facial expressions, posture, and tone of voice, are helpful for understanding underlying emotions, attitude, and feelings. So. For this purpose we generating new approach to to recognize the personality using different machine learning algorithms.

Existing System

In the existing system, in organization HR department invites resume for recruitment. Then they analyze the resume for skills. Then conduct the interview. In interview on the basis of candidate's emotion they will identify the right person for organization.

Proposed System

In proposed system, we are developing the personality recognition system using asynchronous video analysis. For making this system we are using tensorflow library. Using machine learning algorithm like naive bayes, Support vector machine (SVM), or Random forest we will make model for classify the resume. And same algorithm will be used for analysis of the tone which will converting into the text. For video based face feature analysis With the help of CNN algorithm and face landmark user face

will be captured by camera and feature extraction of face will be done which will result in obtaining output such as happy face, entertaining face, good gesture, good smile.face categories will be added and trained with convolution neural network. Random forest ,naïve bayes ,svm model will be prepared for tone analysis.

II. METHODOLOGY

This project we will develop using Python and its inbuilt library tensorflow. We will develop web application as a model within we will show our project as a model. For resume classification and tone analysis we will use machine learning algorithm like Naivey bayes, SVM or random forest. Using CNN algorithm and face landmarks we extract the feature of the face which is the video. face categories like happy face, entertaining face ,good gesture, good smile etc. will be added and trained with convolution neural network. Effectiveness with the organization will be analysed. for checking the performance of interview user must have register and login in our system.

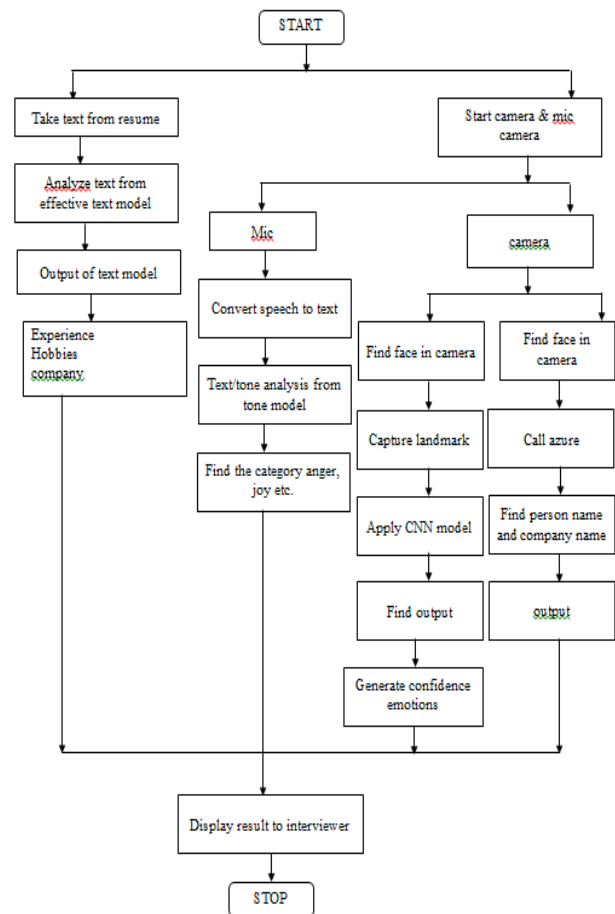


Fig1: Flowchart of the System



Fig2 Model generation

III. LITERATURE REVIEW

Tensorflow-Based Automatic Personality Recognition Used In Asynchronous Video Interviews-Hung-Yue Suen , Kuo-En Hung, And Chien-Liang Lin

In this paper, an end-to-end AI interviewing system was developed using asynchronous video interview (AVI) processing and a TensorFlow AI engine to perform automatic personality recognition (APR) based on the features extracted from the AVIs and the true personality scores from the facial expressions. The main task of this study is to predict the big-five traits personality dimensions from video images by using machine learning techniques and artificial neural networks.

According to social information processing theory, people observe and interpret the cues exhibited by others and draw conclusions regarding their personalities during interactions such as interviews. It illustrates how an interviewer uses cues to judge the interviewee's personality and to show the relationship between the interviewee's self-assessed personality and the interviewer's perceptual observations of personality regarding the interviewee.

The interviewees externalize their apparent personality through distal cues (i.e., any observable behaviors that can

be perceived by the interviewer, such as facial expression, gaze, posture, body movement, speaking, and prosody). Alternatively, the interviewer uses a "lens" to attribute the unobservable personality traits of the interviewee through proximal cues (i.e., any interviewee behaviors that are actually perceived by the interviewer, including indirect observable cues); nonetheless, these cues can translate into perceptions by the interviewer.

By extracting features from the audio-visual data of AVI, APR is intended to auto-recognize an interviewee's self-assessed personality from distal cues. In contrast, APP is intended to auto-predict the observer-rated personality of an interviewee from proximal cues.

Sentiment Analysis of Speech-Aishwarya Murarka1, KajalShivarkar, Sneha, VaniGupta, Prof. LataSankpal

In human-computer type of interaction, properly comprehending the meanings of the words or the linguistic category and recognizing the emotion included in the speech is essential for enhancing the performance. In order to model the emotional state, the speech waves are utilized, which bear signals standing for emotions such as boredom, fear, joy and sadness etc. So we can find different speech signals of each subject. The capability of detecting the sentiment of the speaker in the video can serve two basic functions: (i) it can enhance the retrieval of the particular video in question, thereby, increasing its utility, and (ii) the combined sentiment of a large number of videos on a similar topic can help in establishing the general sentiment. Our approach towards sentiment extraction uses two main systems, namely, Automatic Speech Recognition (ASR) system and text-based sentiment extraction system.

For text based sentiment extraction, we propose a new method that uses POS (Part-Of-Speech) tagging to extract text features and Maximum Entropy modelling to predict the polarity of the sentiments (positive or negative) using the text features. An important feature of our method is the ability to identify the individual contributions of the text features towards sentiment estimation. We evaluate the proposed sentiment estimation on both publically available text databases and videos. On the text datasets, This provides us with the capability of identifying key words/phrases within the video that carry important information. By indexing these key words/phrases, retrieval systems can enhance the ability of users to search for relevant information.

IV. RELATED WORK

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V. DESIGN AND ANALYSIS

Modules of APR:

The system module consists of a **user module** and **admin modul;**

1. User Module- The user login would be used by the applicants to check their personality. User attempts questionnaire views the Results. Candidate needs to create and submit their CV by filling the CV form. The CV format should be done accordingly specified by the system. The admin login would be used by the recruiting company to check the personality and Technical skill of the candidate the admin can view all the registered candidates' details.

2. Admin Module- The admin can view the results of the individual candidates which can be easy for the admin to select the desired candidate. The details of the candidate in results page include name, age, address, personality and his/her major technical skill for recruitment after successful upload of the CV, the candidate can proceed with the online test based on personality. The questionnaire contains 1 question each from these 5 traits are given to the user each question of marks 2 and there will be a total of 5 questions 1 question belonging to each personality trait. Based on the user's response to each question in a trait marks are assigned to him.

VI. FUTURE MODIFICATIONS

In future work, we may combine our visual approach with prosodic features to learn how to recognize an interviewee's personality. Moreover, this study utilized a specific type of professional as participants, which may limit the generalizability of these experimental results. Future research should include a more diverse participant population.

In future modification, we will use different machine learning algorithm will use for improve accuracy of the result. For face analysis add more face landmarks for generating model which will help for getting result. Also compare result with other algorithm and use best algorithm in System.

VII. CONCLUSION

This project is for personality computing. In traditional personality computing, validating APR using manually

labeled features from any possible detectable distal cues was quite complicated. This project developed an AVI embedded with a TensorFlow-based semi-supervised DL model to accurately auto-recognize an interviewee's true job applicants. Our system will provide better and efficient solution to current hiring process. This will provide potential candidate to the organisation and the candidate will be successfully be placed in an organisation which appreciate his/her skillset and ability.

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