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Tensor Flow-based Automatic Personality Recognition Used in Asynchronous Video Interviews

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Abstract— With the event of computing (AI), automatic video chat analysis to find individual temperament traits has become a lively space for analysis and their square measure applications for laptop temperament, human-computer interaction, and psychological testing. Advances in laptop recognition and pattern recognition in terms of deep learning (DL) techniques have diode to the event of convolutional neural network (CNN) models that may effectively find human identity and supply temperament traits through the camera. In this study, the end-to-end AI interview system was used victimization asynchronous video interview (AVI) process and therefore the TensorFlow AI engine to perform automatic personal recognition (APR) supported AVIs-based options and realistic personalities supported facial expressions and rumored personal queries. a hundred and twenty candidates for real work. check results show that our AI-based chat agent will with success find "five major" options of the person you spoke with accuracy between ninety.9% and 97.4%. Our experiments conjointly show that though machine reading was performed while not huge information, the incomprehensible deciliter methodology performed astonishingly well by police work the automated character despite the absence of a dynamic text annotation. associate AI-based interviewing agent will increase or replace existing personal self-assessment ways that job candidates might distort to realize desired ends up in the community.

Keywords: personality recognition, face emotion analysis, speech to tone analysis, TensorFlow, company verification, azure

I. INTRODUCTION

Industrial and structure (I / O) psychologists have found that temperament is that the most well-liked methodology of selecting a worldwide employment. Some employers use self-reported surveys to live the temperament of job applicants; but job candidates will lie once they report their temperament so as to induce additional job opportunities [1]. Some employers check candidates' personalities from their face and different insignificant clues throughout job interviews as a result of applicants have a heavy drawback creating outlaw references. However, it doesn't add up for anyone applying for employment to attend a live interview or participate in phone interviews or internet conferences for a collection quantity of your time and time. One asynchronous video interview (AVI) computer code will be wont to mechanically communicate with job candidates ML, DL feature removal is automatic rather than manually.

II. LITERATURE SURVEY

In this paper, the end-to-end AI interview system has been developed using asynchronous video interview (AVI) processing and the TensorFlow AI engine to perform automated personal recognition (APR) based on features derived from AVIs and true personality traits from facial features. The main task of this study is to predict the magnitude of five-dimensional features from video images using machine learning techniques and artificial neural networks. In the context of the analysis of social data, people look at and interpret the indications presented by others and come to conclusions about their personalities during interactions such as interviews. It shows how the interviewer uses clues to judge the interviewer's personality and shows the relationship between the self-assessed personality and the interviewer's perception of the interviewer. The interviewees extracted their obvious personality by using distant gestures (i.e., any behaviors that may be visible to the interviewer, such as facial expressions, looks, posture, body movements, speech, and prosody). Alternatively, the inquirer uses a "lens" to display non-existent personality traits of the interviewee using nearby references (e.g., however, these references may translate into comments by the interviewee of the interviewed person from remote features. In contrast, the APP is intended to automatically predict the limited viewing personality of the interviewer from nearby features. to show the relationship between the interviewee's self-assessed personality and the interviewer's perception of the interviewer. 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.

III. METHODOLOGY

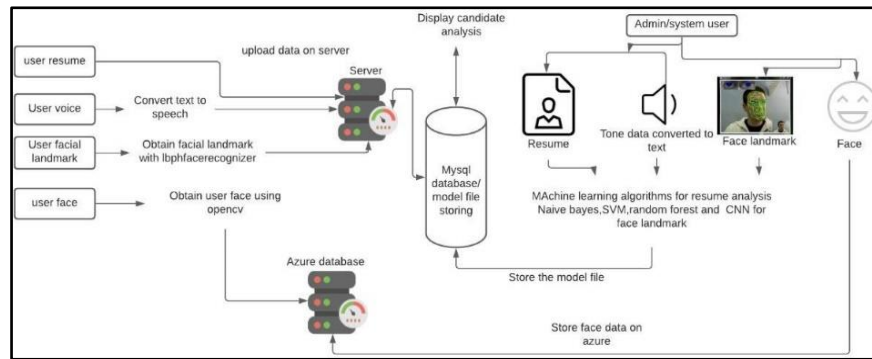


Fig. 1. System Architecture

This system can be divided into 5 phases-

Phase 1: User will register & login into a system. User credentials will be used to verify a User.

Phase 2: Parsing the resume using Resume parser library and preprocessing is done internally using DNN algorithm for implementation of a job recommendation and candidate’s key features. Resume of candidate will be given as an input.

Phase 3: This phase Captures the face and generates categories such expressions like angry, sad, surprised, happy, etc. Then it gives the count of facial expressions. It helps interviewer to make a better decision about a candidate.

Phase 4: This phase Captures the live speech with the help of mic and generates categories such expressions like angry, sad, surprised, happy, etc. Then it gives the count of emotions. It will help interviewer to make a better decision about a candidate.

Phase 5: It Verifies candidate using AZURE database. It helps to verify the candidate and gives important information. User details like username will be given as an input.

IV. BACKGROUND

A. PERSONALITY TAXONOMY

Personality defines individual variation by factor ways of thinking, feeling, and behaving. This construct is commonly used to predict whether a job candidate will perform well in a specific job role and engage well in a prospective cultural environment [20]. The core factors of the big five are categorized into different cultural contexts; these are openness, conscience, transformation, harmony, and neuroticism [21].

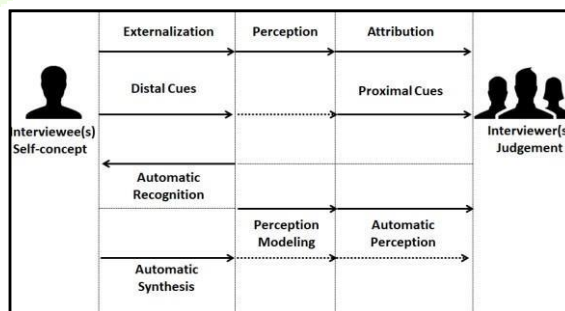


Fig 2. Brunswick’s of Personality Computing

B. PERSONALITY COMPUTING

In the context of the analysis of social information [22], people look at and interpret the indications shown by others and reach conclusions about their personality during interactions such as interviews. The Brunswick lens model, shown in Figure 1.2, shows how the interviewer uses methods to judge the interviewer's personality and shows the relationship between the self-assessed personality you hear and the interviewer's perception of the interviewer [6]. Interviewees cast their visual personality through the use of separate sleeves (i.e., any behaviors that can be seen in the interviewer, such as facial expressions, looks, posture, body movements, speech, and prosody). Alternatively, the interviewer uses a “lens” to indicate the abstract personality traits of the interviewee using nearby references (i.e., any interviewee behavior observed by the interrogator, including unintelligible symbols). however, these indicators can translate into the views of the interviewer [6], [23].

V. DATA PROCESSING

A. DATA COLLECTION

To establish our database in the actual context of the job interview, we created AVI-based software, similar to the function in [42]. The content of the video responses can be used to perform algorithmic analysis, including audio and visual analysis of the video responses. During AVI, respondents' responses can be recorded simultaneously but later updated by algorithm. All applicants were provided with the same questions, aimed at the behavior to assess applicants' communication skills based on job description. Each query is displayed on a new screen, and the sound of text queries is automatically activated when applicants enter the screen. The questions were presented on one screen at a time in a row and applicants were given a maximum of 3 minutes to answer each question. Applicants may choose to skip to the next question within 3 minutes. After 3 minutes, a new screen appears with the next question. Including one practice test, the entire video interview process lasts about 20 minutes.

B. DATA LABELLING

To compile the actual ratings for the five major features [6] each, we used a list of 50 global items composed of [43] to measure the applicants who rated the five major features. This process was performed to minimize the effects of social desire, which may interfere with personality traits that we have measured in an effort to find employment [44].

C. DATA EXTRACTION

To capture the facial expression of the applicants, we started with Inception-v3 data pre-collected by ImageNet, which includes more than 14 million images collected in 1,000 categories. In addition, we trained facial acquisition model according to OpenCV and Dlib while tracking 86 face points per frame, as shown in Figure 3. To enhance the feature finder, we have released a photo frame independently from our AVI database using FFmpeg.

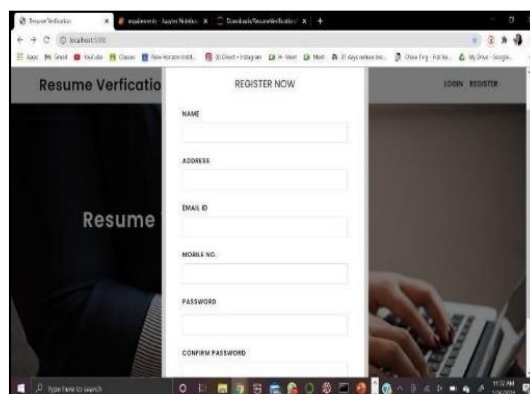
VI. DESIGN AND ANALYSIS

1. User Module - User login will be used by applicants to check their personalities. The user is trying to ask questions about the results. The applicant needs to create and submit his or her CV by completing the CV form. The CV format must be properly formatted according to plan. The admin login will be used by the recruiting company to check the personality and technical capabilities of the registered administrator who can view all the details of the registered subscribers.
2. Admin Module - The administrator can view the results of the candidate which may be easier for the administrator to select a candidate. The details of the person registered on the results page include name, age, address, personality and his or her professional recruitment after successfully uploading the CV, who will be able to continue online testing based on personality. The questionnaire contains 1 question each of these 5 features given to the user for each of the 2-mark questions and there will be 5 questions for 1 question per person. Based on the user's response to each question on the feature marks given to him or her.

VII. FINAL RESULTS

1. User Login & Registration

This image describes the User Login & Registration, there are two options login & register email. After Registration user will login into our system.



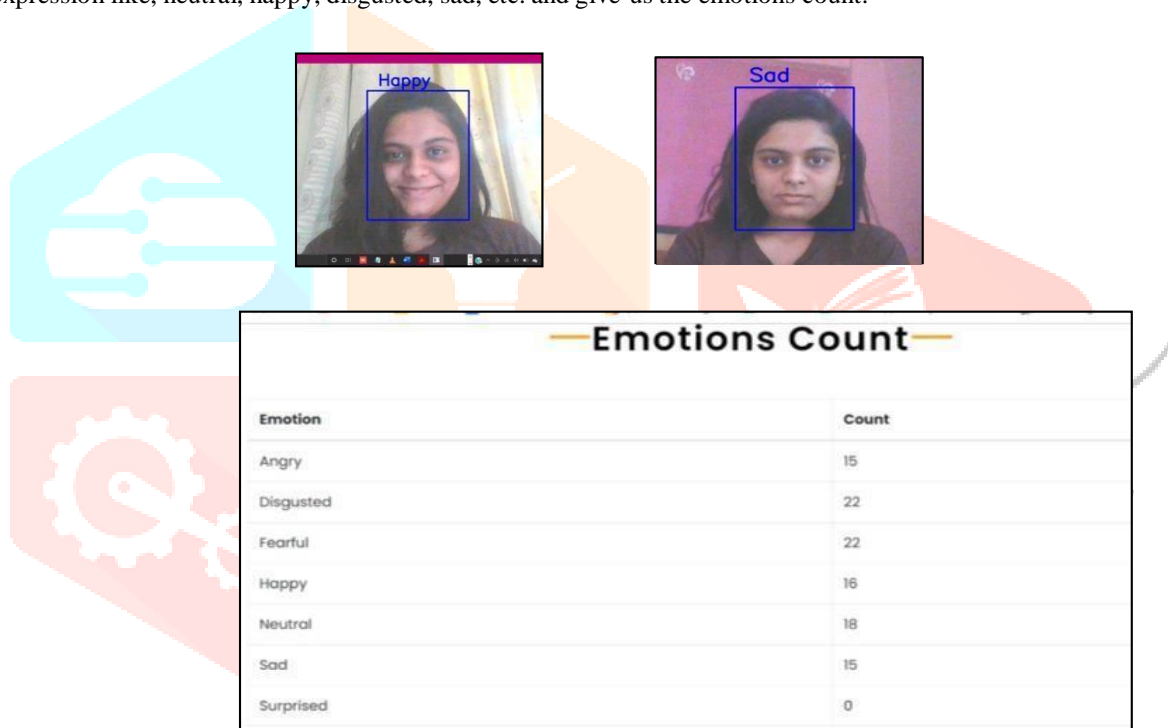
2. Resume Analysis and Classification

This image describes the Resume analysis and Classification. After Login, candidate will upload the resume in PDF Format this will give candidate's skillset and more accurate designation of candidate.



3. Face Emotion Recognition

This image describes the facial expression of the candidate during the interview. For this Video emotion Webcam will be started & capture the facial expression like, neutral, happy, disgusted, sad, etc. and give us the emotions count.



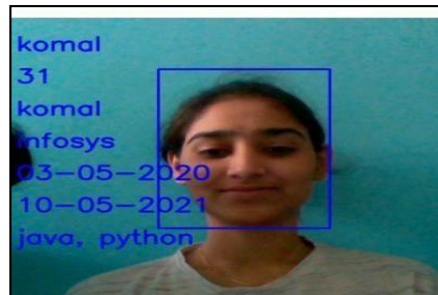
4. Speech Emotion Recognition

This image describes that when candidate will be giving answers livespeech will get recorded using mic and we will use that to analyze the tone of candidate during the interview. As an output it gives categories as whether the candidate is male or female. It also senses the emotion in candidates voice like whether candidate is sounding confident, nervous, fearful, etc.



5. Candidate's Company Verification

This image describes that company verification can be used to get candidate's details like where he/she has worked before and for how long. It also gives the details about technologies candidate has worked on. This helps us to verify the user.



id	username	company_name	start_date	End_date	technology_worked
31	komal	infosys	03-05-2020	10-05-2021	java, python
32	komal	cap	15-05-2020	10-08-2021	java, python

VIII. FUTURE MODIFICATIONS

In the next activity, we can combine our perspective with prosodic features to learn how to identify the person to whom we are speaking. In addition, the study used a specific type of expertise as participants, which could reduce the likelihood of these test results. Future research should include the number of different participants.

In future modifications, we will use a different machine learning algorithm that we will use to improve the accuracy of the result. Facial analysis adds global facial features to model that will help in achieving results. Also compare the result with other algorithms and use the leading algorithm in the System.

IX. CONCLUSION

This project is for computer use. On a traditional personal computer, validating the APR using hand-labeled features from any distal indicators that might seem too difficult. The project developed an AVI installed with the TensorFlow-based semi-supervised DL model to automatically detect real job applicants. Our APR method has achieved more than 90% accuracy, successfully performing previous related laboratory studies with an accuracy of between 61% and 75% in the case of oral communication. The effective APR used in this AVI can be accepted to add or replace personal self-assessment methods that may be confused by job applicants as a result of the social demand for employment. Previous related studies have found that a variety of factors (picture and sound frames) studied by deep neural networks can bring better performance in predicting five major factors than informal factors.

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