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Automatic Evaluation of Communication Competency in Diverse Environments

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Abstract: Effective communication is a critical social skill that helps us understand and relate to others. It is also crucial in job-related interviews. In this project, candidates' communication skills in two types of behavioural interviews—a written interview that includes a brief essay and an interface-based, asynchronous video interview—are methodically studied and automatically measured. Next, by utilizing deep learning methods and machine learning XGBOOST, we suggest a prediction model that makes use of automatically extracted multimodel features such as audio, visual, and lexical. While all currently available technologies predict essays with an accuracy of 80–90%, our XGBOOST technology predicts essays with an accuracy of 95–96%. The capacity to effectively and efficiently convey knowledge to others is known as communication proficiency.

Keywords: Communication Skills, XGBOOST, Interviews, Deep Learning, CNN.

I. INTRODUCTION

Proficiency in communication skills is beneficial in several spheres of life, ranging from social interactions to business meetings and all points in between. Proficiency in several forms of communication is an essential prerequisite for all knowledge worker job profiles. Verbal, written, and non-verbal communication are possible forms.

The spoken word and face-to-face interactions with others are only two examples of communication abilities. Another important skill is being able to write efficiently and coherently. Automation of the process has been made possible by the recent development of machine learning in the recruiting area, also referred to as hiring analytics or recruitment analytics. Solutions such as online applications and social recruiting

The future of the employment process is thought to involve video interviews. Numerous automated talent evaluation programs more popular. These systems provide screening and interviews everywhere. However, there aren't many urgent issues that require attention. In such automated environments, how do applicants perform? What variations have you seen between the candidates in each setting? In this study, we address responses to these queries. In order to complete this assignment, we used a specially designed online interface to gather participant interviews in three different formats: written, video, and short essay. Subsequently, we conduct diverse analyses on the data and construct a predictive model to autonomously evaluate the participants' communication proficiency.

Verifying the viability of the automatic assessment solutions is the aim of this research. The goal is to examine how the participants' behaviour and performance vary depending on the environment. We speculate that the performance is context-independent.

II. LITERATURE SURVEY

[1] Evaluation of Communication Skills During Interviews.

This thorough analysis examines how communication skills are evaluated in interview situations, emphasizing unconventional formats. An overview of current approaches, difficulties, and prospects for automatically assessing communication skills are given in this study. It prepares the ground for the adoption of cutting-edge techniques meant to improve the impartiality and accuracy of communication skills evaluation, particularly in unconventional interview situations

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[2] Natural Language Processing for Automated Communication Skill Assessment.
This study gives a detailed analysis of approaches for automatically evaluating communication abilities in nonconventional interview contexts, with a focus on natural language processing (NLP). The study investigates the use of natural language processing (NLP) techniques.

[3] Multimodal Methods for Evaluating Video Interview Communication Skills
This work discusses multimodal ways for evaluating communication abilities in video interviews, taking into account the multimodal character of communication. In order to provide a comprehensive assessment, the study investigates the integration of visual and auditory clues, such as body language, tone of voice, and facial expressions. The usefulness of multimodal techniques in capturing subtle facets of communication abilities in unconventional interview contexts is evaluated through comparative analyses.

[4] Automated Communication Skill Assessment: Ethical Aspects to Take in to Account for Responsible AI
This research explores a paradigm for responsible AI in the automatic evaluation of communication skills, with an emphasis on ethical issues. The study addresses ethical issues with algorithmic assessments of communication abilities by investigating procedures for transparency, fairness, and user permission. The integration of user input and ethical evaluations provides valuable insights for the development of assessment systems that give priority to ethical and responsible AI practices in unconventional interview scenarios

III. IMPLEMENTATION

Generate and Load Assessment Model: Using this module, we will load all essay prediction, audio and facial expression prediction algorithms model.

Visual Interview Assessment: Using this module, we will start WEBCAM and then monitor person face for 20 frames and then take average of all expression and based on expression system will predict output as confident or confuse.

Spoken Interview Assessment: Using this module, we will upload audio file and then application extract all audio features and then from voice application will predict weather person is confuse or confident.

Written & Short Essay: Using this module user can upload essay and then system will predict essay communication skill score.

IV. RESULTS

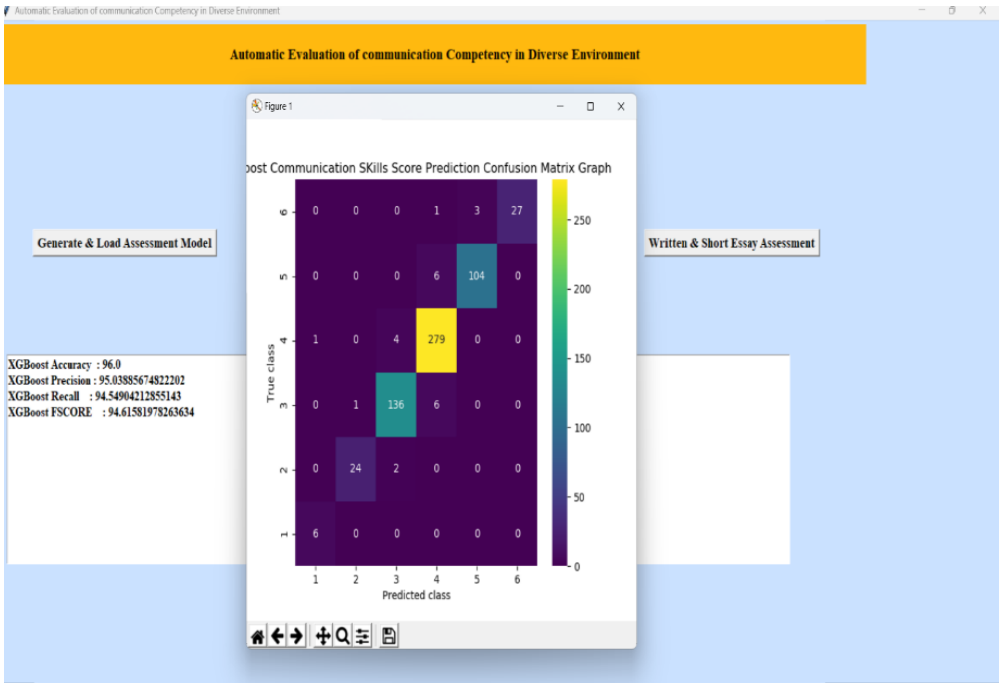

Fig: 1. Load Model

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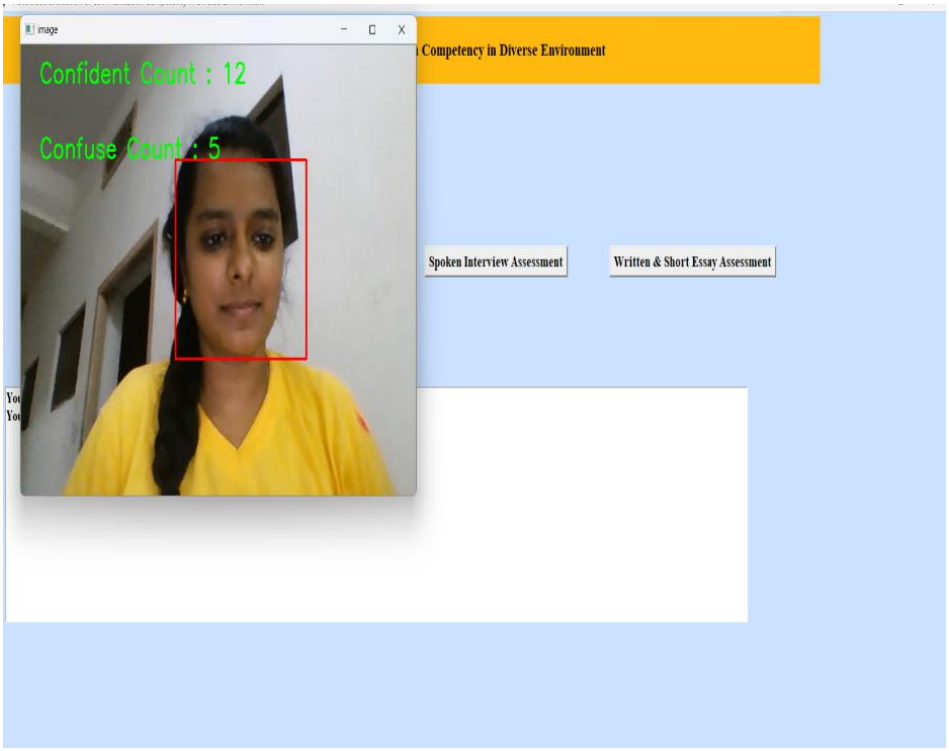

Fig: 2. Visual Interview

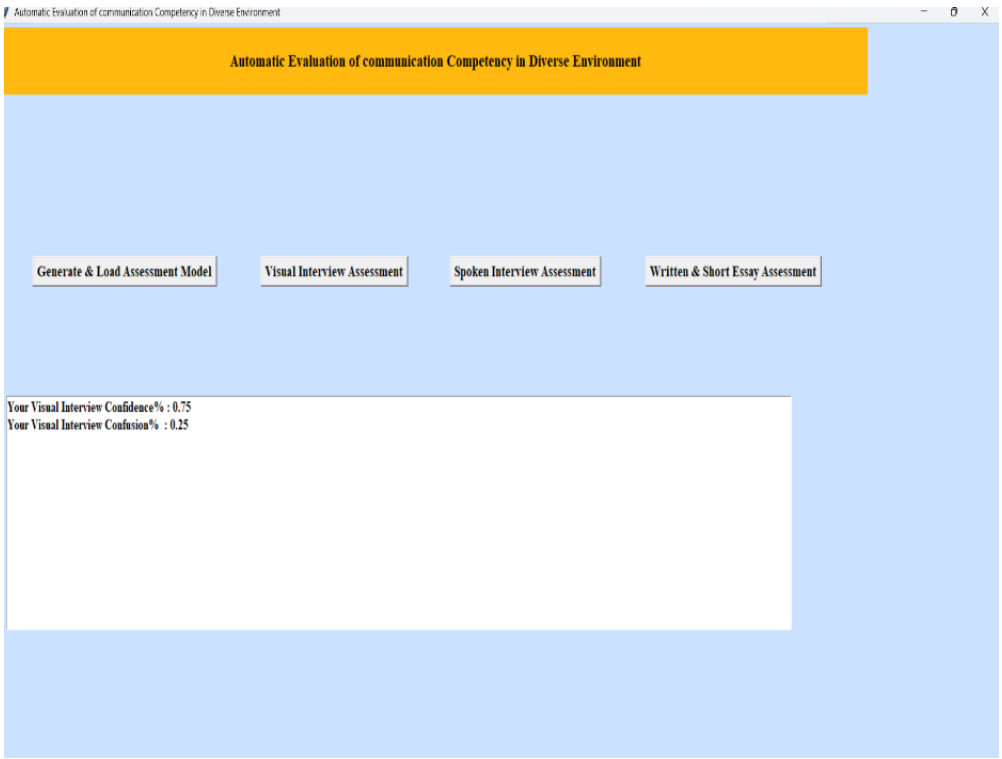

Fig: 3. Video Output

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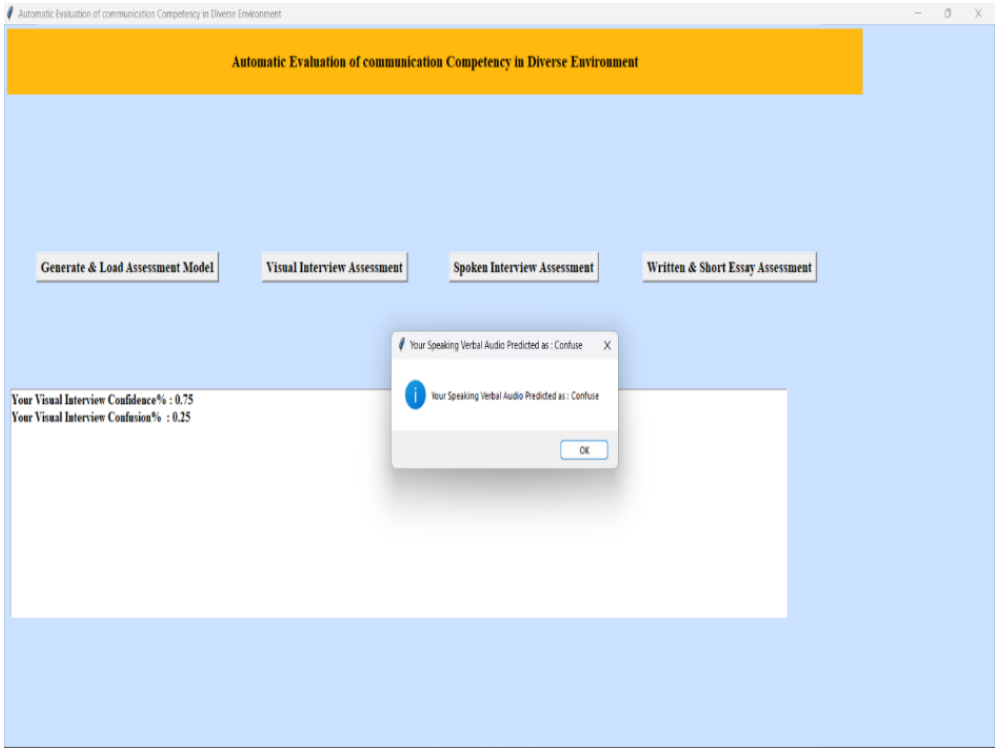

Fig: 4. Spoken Output

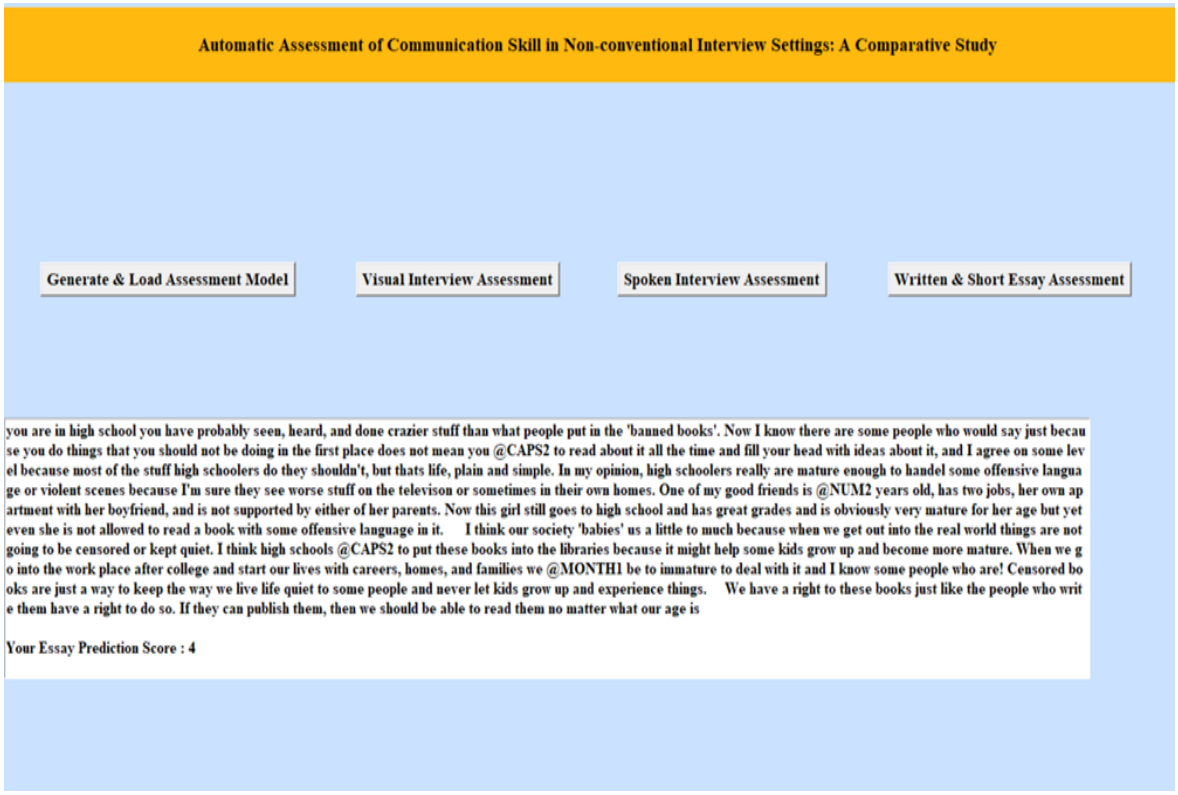

Fig: 5. Essay Output

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V. CONCLUSION

In this paper, we presented an empirical attempt to tackle the problem of automatic assessment of communication skill in nonconventional interview settings. Video interviews, written interviews and short essay are the three settings we have considered. We propose a framework to automatically predict the communication skill and also compare the perceptions of the human experts and the automatic predictions. For this task, a custom-built web-based interface was developed to scientifically collect the data for all the three settings in a controlled environment. A dataset of about more than 100 participants has been collected for each of the interviews. The entire dataset is collected through the interface without any human intervention.

VI. FUTURE WORK

Regarding the qualities anticipated of applicants in an interview, we propose a new feature set we refer to as the trait elements. This works well with the written communication skill prediction when combined with the lexical characteristics and sentiment expressions. The features chosen with the Boruta feature selection approach work well in terms of the essays. In the future, this study can be expanded to include studies on a sizable and diverse population. It is possible to look at enhanced feature groups that record the same elements of the behavioural interviews in every situation. A deeper user research project could be undertaken.

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