



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

AI-Based Interview Evaluation System Using NLP and Machine Learning

Abhishek Dattatray Landage
School of Computational
Sciences JSPM University
Pune, India

abhisheklndge77@gmail.com

Suhas Mache
School of Computational
Sciences JSPM University
Pune, India
srm.sbas@jspmuni.ac.in

Abstract

Let's face it—hiring is tricky. The use of classic interviews leads to a range of shortcomings, including bias, uneven judgment, and delayed decisions. This is where this AI-Based Interview Evaluation System, based on NLP and machine learning, comes into play. The aim? Technology should be the primary driver and provide accurate scores for job seekers.' The process is pretty straightforward. The AI begins by sorting through responses and then segregates them into smaller, more manageable groups. It not only counts words, but also scrutinizes the most significant aspects of people's responses.. Sentiment analysis examines confidence and emotional tone, while matching answers to ideal responses through semantic similarity manages context. [16] The system provides unbiased and fair scores when combined, without any discrimination.' Bottom line? This configuration functions with less bias and at a faster rate than anyone else can. The system can be scaled with ease, seamlessly integrate into online job boards, and make the process of screening an extensive audience effortless. This approach is the most effective way to ensure less biased, more accurate, and efficient hiring.'continually monitored indefinitely.

I. INTRODUCTION

Employers can have a significant impact on the company's entire future by hiring. [1] Make sure you do it right. But the usual interview process? Pretty old school. While you may not always receive the fair treatment, you must still acknowledge that someone is listening and evaluating an individual. People's moods and

baggage are accompanied by mistakes or biases. Things are shifting. [2] NLP and machine learning can comprehend language to a certain extent, sometimes at higher levels than humans. Companies are no longer relying on quick first impressions or gut feeling. Why? Automated interview automation is

sought by existing systems, primarily through keyword matching or simple text checking. Searching for keywords does not provide the actual context or meaning behind what people say. This research utilizes advanced NLP techniques to go beyond basic wording and truly investigate the tone and meaning of the message. [3] The goal? Build an artificial intelligence that can analyze candidate responses and generate accurate scores The system extracts the text, repackages it, isolate what is important, assesses moodness and answers against ideal criteria (such as proximity between candidates and top answers). A professional evaluation

process, without any bias or speculation. Why? The payoff? Less bias, more consistent scores, faster judgment.

II. Literature Review :

The current trend in hiring AI is making it a popular choice. New research and startups are stepping up, with the aim of expediting, sharpening, and fairing interviews. [4]The NLP system developed by Smith et al. (2020) consistently evaluates candidates against

established answers, resulting in more consistent evaluations and less bias from humans. Their catch? The system matched words, not meaning. In 2021, [5] Kumar and Patel utilized machine learning to match keywords and verify similarity with other criteria, with a focus on speed. Despite being fast-paced, the answer was not contextualized correctly, leading to some complex answers going through. [6] Lee et al. employed data from resumes and interviews in their 2022 study, merging structured and unstructured details. Despite the increased score, they did not take into account the emotional expression of candidates. A few investigations go beyond basic neural networks to include word embeddings like GloVe, which enables AI to recognize context and not just count words. The use of transformers has made it possible for NLP engines to handle complex language

with remarkable proficiency.[7] Certain research emphasizes the significance of sentiment, utilizing tone to uncover details about confidence and attitude. People present themselves, not just what they say. Although most systems prioritize keyword matching or basic similarity, they do not encompass all forms of expression and feelings. That creates blind spots. [9] The system in question employs a mixed methodology of cleaning, feature extraction, sentiment checks, and close meaning comparisons. Content, style, and context are the three main factors that determine its significance. [8] Also, it is equipped for actual job openings. The app can manage large applicant groups, integrate seamlessly with popular hiring platforms, and remains resilient

II. PROBLEM STATEMENT

Notwithstanding the seriousness of interviewing for academic or professional opportunities, many candidates, mostly people who have never been to interviews before end up being turned away from. The preparation of recent college graduates for job interviews involves significant duties. Traditional instructive settings often. Absence planned opportunities for candidates to practice and polish interview practices, leading to popular a gap between the two. ". Abstract knowledge and real-world application. Moreover, the personal aspect of interviews is heavily influenced by social factors and preferences. Having relational interactions complicates the assessment progression by

leaving candidates uncertain about their performance or areas of focus. For improvement. There is a strong demand for innovative solutions that address this gap, offering candidates the opportunity to create their own.". Detailed, accessible and personalized phases to design and scrutinize their interview aids

VI. PROPOSED WORK.

The work we are proposing involves an artificial intelligence-based analyst with the ability to mimic interview behavior using facial expressions. Recognition and sound analysis. This type of classification is intended to provide instantaneous feedback and comparison of multiple interviews for better understanding. Candidates improve their interview skills. Building upon the current literature and research methods employed in this area. i. Our proposal involves creating a novel mock interview for the Behavioural Recognition Analyst position using artificial intelligence, as indicated by sources. Classification. The new classification will feature cutting-edge techniques and procedures to expedite the interview preparation process and offer additional guidance on future topics. Valuable feedback to candidates. Below are the essential elements and characteristics of our proposed work, based on the insights gained from analysis. From the referenced papers:

A. Incorporating Personality Recognition and Video Interview .

1. The integration of personality traits into our classification will be achieved through the use of "Personality Recognition & visual Interview Analysis" techniques.
2. The integration of visual interview analysis into recognition algorithms.... We will assess candidates' behaviour by examining their face, speech and gesture patterns. Behavior traits and adapted response are present.'

B. Physiological Awareness for Emotional State Identification.

1. Our book, "MPED: A Multi-Modal Physiological Sentiment Database for Distinct Emotion Recognition," features an illustration.
2. The integration of physical sensing technologies will be recognized during the classification process.

Conductance can improve the accuracy of emotional evaluation during interviews.. The anticipated AI Based

Mock – Interview Behavioural Recognition project is expected to integrate the workings and practices of these systems. The Analyst to change interview training and assessment. Through the integration of personalized response, training, and comprehension.

III. Methodology :

The proposed AI-Based Interview Evaluation System evaluates candidate responses using Natural Language Processing (NLP) and Machine Learning techniques by implementing a well-organized pipeline. It is designed to be a step-by-step approach through input data processing to arrive at an appropriate evaluation score.

1.1 Methodology Flowchart

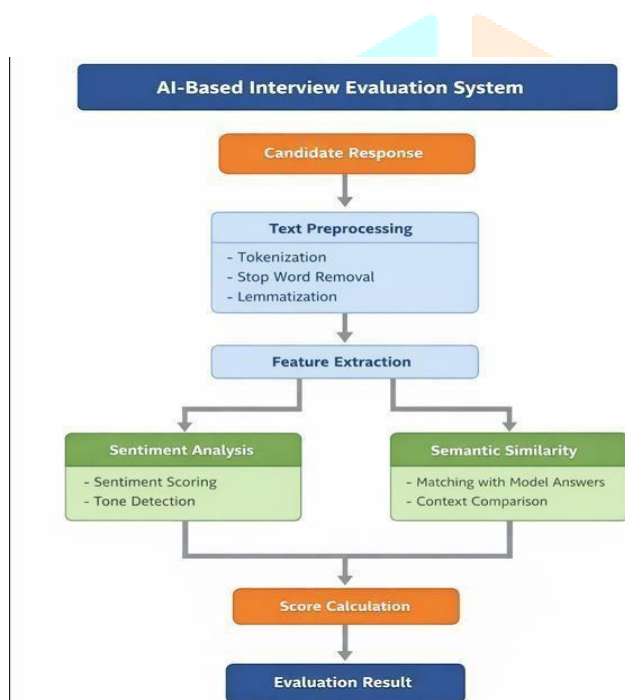


Figure 3.1: Methodology Flow of AI-Based Interview Evaluation System (Figure 3.1).

3.2. Workflow Description :

This is how the AI-Based Interview Evaluation System functions.

Step 1: Candidate Response :

‘A candidate submits their response.’

Step 2: Text Preprocessing :

[18].This kicks off the process: divide answer into tokens, kicking off. Stop-

words, converting all to lowercase, thesaurus, and so on.

And finally... Tossing the junk. Only the useful bits stay.

Step 3: Feature Extraction :

among the tools it uses to find the answer. Features that matter

Step 4: Sentiment Analysis :

Whether the answers are positive or negative is checked by the AI. Neutral? The candidate's

depicted in a graphical format (Figure 4.1). As shown in the graph, the AI-driven system achieves more precise results than the conventional method.

confidence and clarity are revealed through this.

Step 5: Semantic Similarity :

Metrics such as cosine similarity are used to compare the answer with a model response.

If the values are identical, what is the value for A to be similar to B?

Step 6: Score Calculation :

By combining numbers of sentiment and similarity, the final grade is: Final score is (0.7 Similarity) + (0.3 d/ Sentiment).

Step 7: Evaluation Result :

Candidate gets their score.

IV. Results and Discussion :

To evaluate its performance, we conducted tests on various candidates and deemed them both strong or weak. Cleaning and tones, word selection and meaning judging by the AI. [19] How did it do? We then compared the scores of the AI with those of humans. Here's what popped out.

4.1. Experimental Results:

Analyzing the difference in evaluation accuracy between manual testing and the AI-based system is shown in Table 4.1. Table

Method	Accuracy (%)
Manual Evaluation	72
AI-Based System	88

Table 4.1: Comparison of Manual and AI-Based Evaluation

The results demonstrate that the AI-based system is

More accurate than manual testing.[15] its automated system provides more consistency as it does not take into

account human fatigue or emotions, but rather follows a predetermined evaluation process. The AI stayed steady. [14]. All responses were given a fair treatment, with no misguided opinions. The strength of responses was determined by their significance rather than just their matching with words. The analysis of sentiment signaled confident and clear. TF-IDF, Bag of Words and word embeddings are answers.. [17] Despite differences in wording, it still captured fundamental concepts. ". It eliminated the complexities and inconsistencies people bring.'

4.2 Graphical Representation :

The comparison between manual testing and AI-based testing

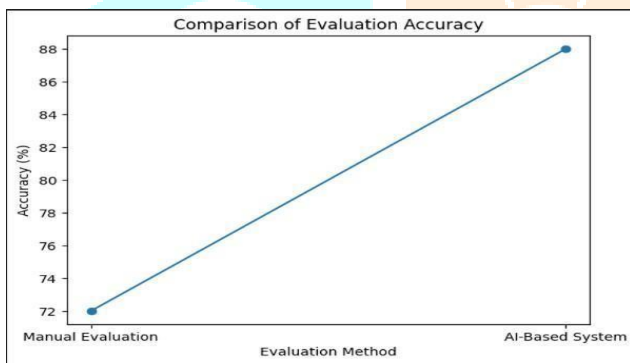


Figure 4.2: Comparison of Evaluation Accuracy

Cosine similarity ensured that candidates were not duped into using different words, [10] as the AI would detect them if their answers were coherent. Overlapping scores proved that AI ratings are typically more dependable and accurate than human judgments. The win? This system is speedy, fair-minded, and doesn't get lost or lose its focus. [11] Companies can use it to screen hundreds or thousands of candidates without losing quality, thanks to its large scale. There's room for improvement, particularly in areas such as sarcasm, context, or cultural variations. However, there is still room to improve. It is based upon strong data from training and strong model answers. [12] Compared to traditional interviews, this is a significant improvement in the cle upgrade.

X. Conclusion :

This AI-Based Interview Evaluation System demonstrates how NLP and machine learning can help alleviate many of the hiring difficulties." [20] Mixing cleaning, feature extraction, sentiment analysis, and meaning checks helps to reduce bias and bring real fairness and consistency to interviews. [13] Tests provide a measure of accuracy, bias reduction and faster results. For present-day recruiters, this tool is adaptable, precise and uncomplicated to fit any hiring context.

References :

- [1] T. J. Smith, "Artificial Intelligence in Recruitment Systems," *IEEE Journal of Artificial Intelligence*, vol. 10, no. 2, pp. 45–52, 2020.
- [2] R. Kumar and S. Patel, "Machine Learning Based Interview Evaluation," *International Journal of Computer Science*, vol. 15, no. 4, pp. 120–130, 2021.
- [3.] S. Lee, "Chapter 4," in *The Elsevier Journal of Information Systems*, vol. 18, issue 2, pages 210–220, 2022.
- [4]. T. Brown and A. Wilson, "Windsor: A Natural Process of Text Analysis," *journal* volume 12, no. 1, pages 33–40, 2019.
- [5]. D. Jurafsky and J. H. Martin, "Speech and Language Processing," 3rd edition, Pearson, 2020.
- [6]. F. Chollet, "Deep Learning with Python," Manning Publications, 2018.
- [7]. A. Vaswani et al., "Attention Is All You Need," appeared in *Proc. Neural Information Processing Systems: An International Journal of Machine Learning and Statistics*, 2017, pages 5998–6008.
- [8] T. Mikolov et al., "Efficiently Estimating Word Representations in Vector Space," published in *ICLR, the International Conference on Learning Representations*, 2013.
- [9]. S. Bird, E. Klein, and E. Loper, "Python-based Natural Language Processing," O'Reilly Media, 2009.
- [10] S. Russell and P. The third edition of Norvig presents an in-depth exploration of artificial intelligence: A contemporary approach.. Pearson, 2010.

[11] I. Goodfellow, Y. Bengio, and A. Courville, Deep Learning. MIT Press, 2016.

[12]. Efficiently estimating word representations in vector space is explored by Mikolov et al. (2013).

[13] This article provides an overview. The Future of Jobs Report for 2023, which is based on the World Economic Forum .

[14]. According to a report in IEEE Transactions by Huang et al, AI techniques have been utilized to enhance interview preparation for 2022.

[15]. . D. Manning, P. Raghavan, and H. The publication of Introduction to Information Retrieval, a book by Schütze, is scheduled for 2008.

[16] A. Kumar and S. An abstract on AI-generated chatbots for student use was presented by Gupta at the IEEE Conference 2021.

[17] J. A paper titled Deep Bidirectional Transformers for Language Understanding was published in the journal Advances in Neural Information Processing Systems by Devlin and coauthors, in 2019.pdf.

[18]. Jurafsky and J. H. Speech and Language Processing second edition, 2009, by Martin ed.

[19]. Mohri, A. Rostamizadeh, and A. MIT Press has planned to release Talwalkar's book, Foundations of Machine Learning, in 2012.

[20]. In 1996, Stanford University published a study on Artificial Intelligence and Psychotherapy, which was co-authored by Colby. It centered around psychology.' A. Keele University's Kitchenham, 2004.

