



International Journal of Advanced Research in Education and Technology (IJARETY)

Volume 13, Issue 3, May - June 2026

Impact Factor: 9.971



Interview Chatbot using Machine Learning

Mrs. J. Reshma, Mrs. Vinitha Mary.S

PG Scholar, Department of Computer Applications, R.V.S College of Engineering, Dindigul, Tamil Nadu, India

Assistant Professor, Department of Computer Applications, R.V.S College of Engineering, Dindigul, Tamil Nadu, India

ABSTRACT: The rapid growth of digital recruitment and online hiring platforms has increased the demand for efficient, scalable, and intelligent interview processes. Traditional interview methods are time-consuming, resource-intensive, and often limited by human availability and subjective evaluation.

To address these challenges, this project proposes an Interview Chatbot using Machine Learning, designed to automate preliminary interview stages, assess candidate skills, and provide real-time interaction in a structured and unbiased manner. The proposed interview chatbot acts as a virtual interviewer capable of conducting automated interviews through natural language interaction.

It uses machine learning and natural language processing (NLP) techniques to understand candidate responses, analyze intent, and evaluate answers based on predefined job requirements. The chatbot asks role-specific technical, aptitude, and behavioral questions, adapting the interview flow dynamically based on candidate responses. This adaptive questioning mechanism ensures a personalized and engaging interview experience for each candidate.

I. INTRODUCTION

Interviews are a critical component of the hiring process, and both candidates and recruiters face challenges in maximizing their effectiveness. Candidates often lack sufficient practice, leading to nervousness and suboptimal performance, whereas recruiters expend significant time conducting preliminary interviews that could be automated. Addressing these challenges, an **interview chatbot powered by machine learning** presents a transformative solution. The concept of chatbots dates back to the 1960s with **ELIZA**, an early natural language processing program that simulated conversation. Over the decades, chatbots have evolved from simple rule-based systems to complex AI-driven agents capable of understanding and generating human-like language. In this project, the focus is on a **smart interview assistant**—a system that uses machine learning to evaluate user responses intelligently, adapt its questioning

II. EXISTING SYSTEM

In the existing recruitment process, interviews are primarily conducted by human interviewers through face-to-face meetings, telephonic calls, or video conferencing platforms. These traditional interview methods require significant time, effort, and coordination between recruiters and candidates.

During large-scale recruitment drives, such as campus placements or online job applications, recruiters often struggle to manage the high volume of applicants efficiently. As a result, initial screening interviews become delayed, and qualified candidates may be overlooked due to time constraints.

Advantages:

1. **Reduced Human Resource Costs:** Automates preliminary interviews, reducing the time and effort required from HR personnel.
2. **Scalability:** Can handle hundreds or thousands of candidates simultaneously without increasing staff.
3. **Improved Candidate Quality:** Provides better preparation for candidates, resulting in higher quality hires.
4. **Accessibility:** Enables organizations or educational institutions to provide interview practice to a wide range of users at minimal incremental cost.
5. **Data-Driven Insights:** Helps organizations analyze trends in candidate performance and recruitment efficiency.

III. PROPOSED SYSTEM

The proposed system addresses the limitations of existing methods by leveraging **machine learning (ML)** and **natural language processing (NLP)** to create an intelligent, adaptable interview chatbot. The system is designed to simulate a real-world interview experience while offering data-driven evaluation and feedback.

Key Features of the Proposed System:

1. Dynamic Question Generation:

Using ML algorithms, the chatbot can generate interview questions dynamically based on the role, industry, and candidate's previous answers. Unlike static scripts, this ensures personalized and relevant interactions.

2. Intelligent Response Analysis:

The system evaluates candidate responses using:

- **Text Classification Models:** To check relevance and correctness.
- **Sentiment Analysis:** To assess confidence, tone, and professionalism.
- **Keyword Matching and Semantic Similarity:** To determine how closely the response aligns with ideal answers.

3. Adaptive Feedback Mechanism:

After each response, the chatbot provides personalized feedback, highlighting strengths, weaknesses, and suggestions for improvement. Over time, it tracks candidate progress and adapts subsequent questions accordingly.

4. Multi-Domain Support:

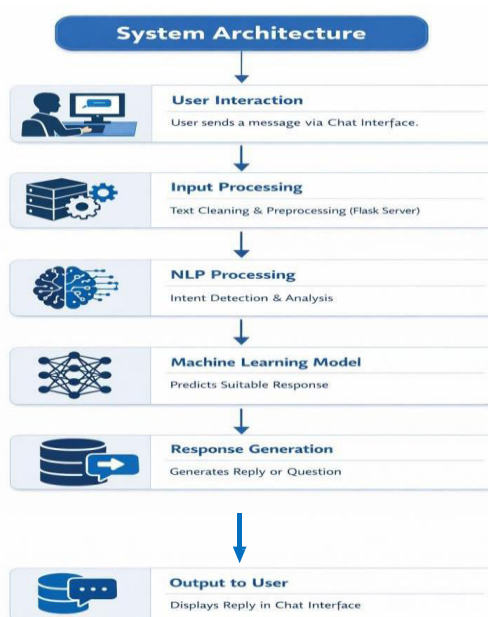
The system can be trained across different industries, job roles, and technical domains, making it versatile and scalable.

5. User-Friendly Interface:

The chatbot will be accessible through web or mobile platforms, offering a conversational interface with interactive dashboards for performance tracking.

IV. SYSTEM ARCHITECTURE

The architecture of the chatbot can be divided into several interconnected layers, each handling a specific function. A typical architecture consists of the following:



V. METHODOLOGY

Data Collection and Preparation

Sources:

- Online interview question banks
- HR datasets
- Public QA datasets

Cleaning:

- Remove duplicates, irrelevant data
- Ensure balanced dataset for all intents

Splitting:

- Training (70%), Validation (15%), Test (15%)

Annotation:

- Label intents and expected answers
- Use human evaluators for semantic scoring

Model Selection and Training

Choose models based on task:

1. Intent classification → SVM, BERT
2. Semantic similarity → Sentence-BERT, Universal Sentence Encoder
3. Response generation → GPT-based fine-tuned model

Training process:

1. Feed preprocessed input into the model.
2. Optimize model parameters (learning rate, batch size, epochs)
3. Validate on separate dataset.
4. Fine-tune for context and domain-specific knowledge.

IMPLEMENTATION

Step-by-Step Workflow:

1. User enters a response in UI → Input Processing Module cleans text.
2. Preprocessed text → Intent Recognition Module predicts intent.
3. Dialogue Management Module decides next question or feedback.
4. Answer Evaluation Module scores user answer.
5. Response Generation Module generates reply.
6. Conversation logs stored in Database Layer.

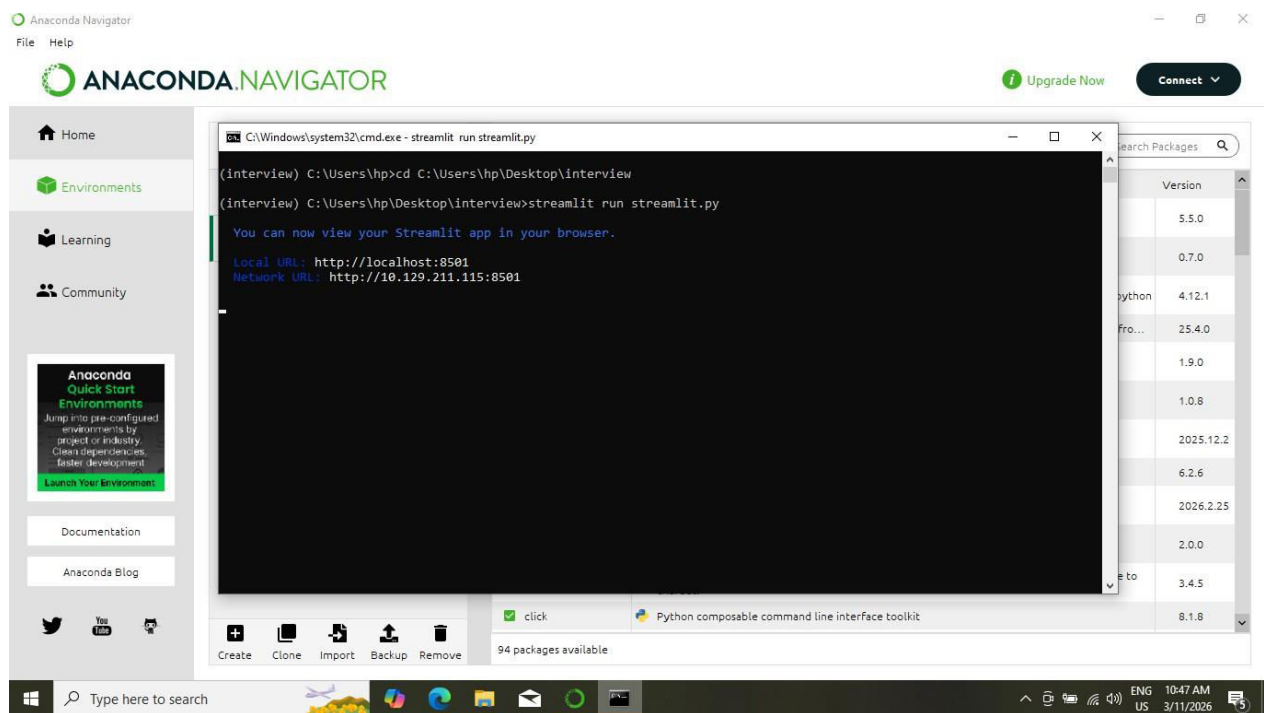
This loop continues until the interview session ends.

Tools and Technologies used:

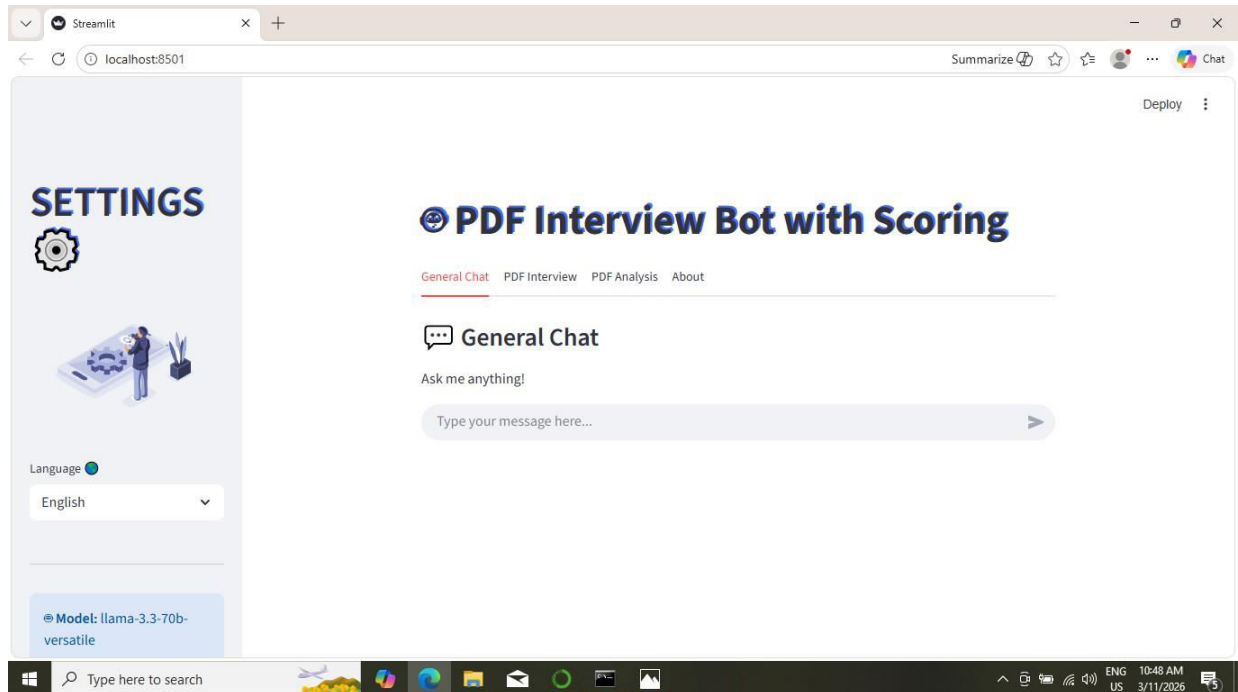
Layer	Technology Choices
UI Layer	ReactJS, Flutter, HTML/CSS
NLP & Preprocessing	NLTK, spaCy, Transformers
Machine Learning	Scikit-learn, TensorFlow, PyTorch
Database	PostgreSQL, MongoDB
Deployment	Docker, AWS EC2, Heroku
Analytics & Logging	ELK Stack, Grafana, custom dashboards

SCREENSHOTS:

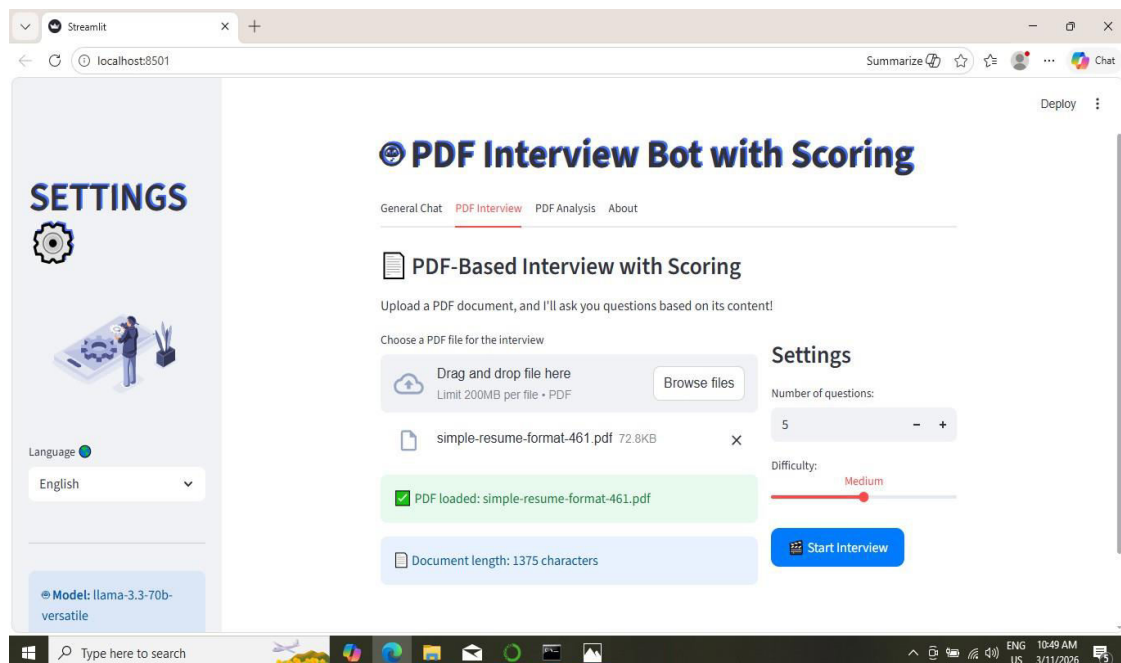
URL login:



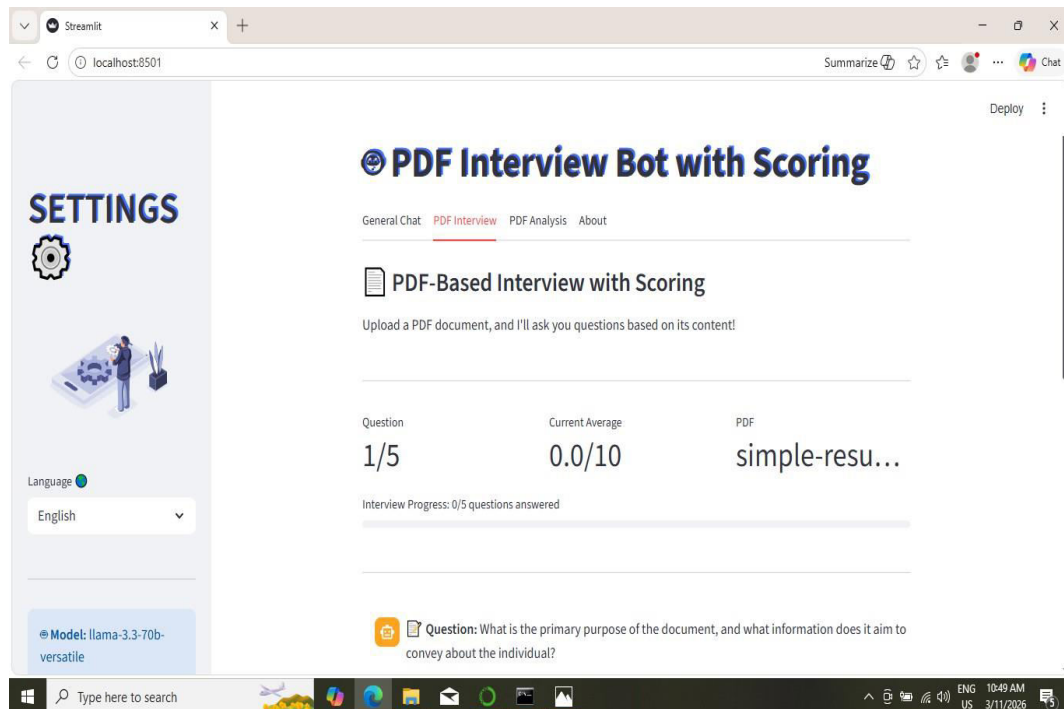
General chatbox:



Resume upload:



Scoring page:



VI. CONCLUSION

The Interview Chatbot using Machine Learning is designed to simulate a real interview environment and help users practice interview questions effectively. The system uses Natural Language Processing and Machine Learning techniques to understand user responses and generate relevant interview questions. This project provides an interactive platform where candidates can improve their communication skills and technical knowledge. By automating the interview process, the chatbot saves time and offers a convenient way for users to prepare for job interviews. In the future, the system can be improved by adding voice interaction, more advanced AI models, and a larger question database to make the chatbot more intelligent and realistic.

VII. FUTURE ENHANCEMENTS

Voice-Based Interaction

Add speech-to-text and text-to-speech Users can speak answers instead of typing Makes it feel like a real interview
Tools: Google Speech-to-Text, Amazon Polly

Advanced NLP Understanding

Upgrade chatbot to understand context, emotions, and intent Use transformer models for more human-like responses
Models: BERT, GPT

Performance Analytics Dashboard

- Showing Strengths & weaknesses
- Score trends
- Improvement suggestions
- Makes it useful for continuous learning

REFERENCES

1. Russell, S., & Norvig, P. (2021). Artificial intelligence: A modern approach (4th ed.). Pearson.
2. Vaswani, Ashish, Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, Ł., & Polosukhin, I. (2017). Attention is all you need. *Advances in Neural Information Processing Systems (NeurIPS)*.
3. Devlin, Jacob, Chang, M. W., Lee, K., & Toutanova, K. (2019). BERT: Pre-training of deep bidirectional transformers for language understanding. *NAACL-HLT*.
4. Reimers, Nils, & Gurevych, I. (2019). Sentence-BERT: Sentence embeddings using Siamese BERT-networks. *Proceedings of EMNLP-IJCNLP*.
5. Mikolov, Tomas, Chen, K., Corrado, G., & Dean, J. (2013). Efficient estimation of word representations in vector space. *arXiv preprint arXiv:1301.3781*.
6. Hochreiter, Sepp, & Schmidhuber, J. (1997). Long short-term memory. *Neural Computation*, 9(8), 1735–1780.
7. Honnibal, Matthew, & Montani, I. (2017). spaCy 2: Natural language understanding with Bloom embeddings, convolutional neural networks and incremental parsing. *To appear*.
8. McTear, M. F. (2017). *The conversational interface: Talking to smart devices*. Springer.
9. Adamopoulou, E., & Moussiades, L. (2020). An overview of chatbot technology. In *Artificial Intelligence Applications and Innovations* (pp. 373–383). Springer.

International Journal of Advanced Research in Education and Technology

ISSN: 2394-2975

Impact Factor: 9.971