Virtual Mock Interview Assistant (Video Bot-based)

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Abstract The Aim of developing this project is to help the user in identifying their strengths and assess their weakness they possess for an interview. The intention is to help the user by making them aware of their personality as well as advise them the specific personality traits and improvements required to succeed in an interview (of organization of their choice.). The paper presents an approach that uses real human audio and video to construct artificial conversational agents and bots. This Approach is different as it begins with real human examples and constructs the artificial behaviours rather than others where the artificial agents construct the real interaction. Video Bots can be considered as a substitute to the human beings in terms of behaviour and emotion, it is possible to develop the video that can behave as human for all practical purposes. This approach also gives some challenges that were faced during the Video Bot preparation for the interview purposes.

1 INTRODUCTION

With the rise in population and awareness of education, there has been a hike in the number of people demanding employment, thus the industries and higher institutions have involved the process of interviewing for recruitment and screening out the best candidates as needed. In order to crack these competitive interviews a candidate must have the knowledge of some ethics, etiquette and protocols along with personality skills, so as to get selected easily.

Chat bots are software that is a conversational interface. Emotional feeling is a peculiar characteristic of humans that differentiates from the machines.

Hence to make chat bots more humanized, an emotional chat bot to analyses the user's sentiment is developed.

Virtual Mock Interview Assistant is a Chat bot based platform that facilitates the user to interact with Chat-bot and get a detailed report that discusses their interview performance, thus allowing them to understand their personality better as well as a way to provide a scope for improvement for the real interview.

Here, we are combining the multi-turn dialogue method and the sentimental analysis method for developing a chat bot, which categorizes the sentences entered in terms of state of emotions and a suitable response is selected

2 LITERATURE SURVEY

Various Research papers belonging to Springer, International Journal of Computer Sciences and Engineering have been referred prior to implementation of the project.

• **Eleni Adamopoulou et. al. [1]** Project involves the use of a Chat bot that facilitates the conversation between the user and machine, concept and design of the chat bot has been referred to from research papers and various internet sites.

• **Aishwarya BR et. al. [6]**Project involves the use of Sentiment analysis that facilitates the process of assessing the weaknesses/strength from the conversation held between user and chat-bot, which has been referred from various international conferences papers and review papers.

• **Krisztian Balog et. al. [5]** involves the use of classification algorithms that help in classifying the interview preparation level of the user, which has been referred from various research papers and review papers.

The paper is based on the idea of **Boris Galitsky et. al. [3]** to make use of artificial intelligence and chat bots for the process of recruitment in order to reduce the human effort and time.

This study in **K. Anitha et. al. [2]** has details of chat bots used all around the globe and analyzes their benefits to choose and create a chat bot that turns out to be effective and efficient for the recruitment process and help the companies to sustain in competitive environment.

The framework used in **Fabio Calefato et. al. [4]** has been previously used in emotion mining during software engineering and provides emotion labels to identify six basic emotions such as: love, anger, joy, sadness, fear and surprise.

Human Behavior can be simulated by interaction with the CIA systems. To validate this idea it is important to prove that behavior of real humans and artificial agents is indistinguishable from each other both with respect to conversational measures and specific application.

Project has video bot technology of **Doug DeGroot et. al. [7]** where the user can have credible dialog with video bot system related to questions and answers apt for an interview.

Video Bot system is integrated with the technology of **Jagdish Raheja et. al. [8]** for capturing the gestures and emotion of candidate during the answer that is provided by them.

PROBLEM STATEMENT

TO HELP THE USER PREPARE FOR INTERVIEW, BY PROVIDING A DETAILED INTERVIEW REPORT AFTER ANALYSIS.

AIMS:

- • To facilitate interaction between the user and Chat-bot.
- • To assist the user in making right career choice.
- • To help the user identify their strengths and
- weaknesses.
  - • To prepare the user for a real interview.
- • To facilitate the scope of improvement via
  - • detailed interview report.
- • To help the user being productive and manage time by focusing on the right areas.
- • To make the user aware of requirements of an interviewer or organization during an interview.
- • To help the user achieve their dreams by helping them prepare for institute/organization of interest.
- • . To make the user aware of possible best choices based on their strengths and weaknesses.

A. TECHNOLOGY USED

1. Image processing: It is a technique of manipulating the digital images to extract more detailed information than is visible in original image.

2. Sentiment analysis: It is a technique of extracting subjective meaning from the source material, which can be further used to understand social sentiment of brand, product, or a service.

3. Speech to text converter: A software program that detects speech and converts it to text, and returns a transcript after analysis. Also called voice to text converter or voice to text translator.

4. Facial emotion detector: Facial emotion recognition is the process of detecting emotions from facial expressions.

5. Artificial intelligence Machine learning

6. Gesture capture from video: Facial expression capture is similar to facial motion capture. It is a process of using visual or mechanical means to manipulate computer generated characters with input from human faces, or to recognize emotions from a user.

7. Emotion Analyzing: 2Met aims to detect and recognize types of feelings through the expression of texts, such as anger, disgust, fear, happiness, sadness, and surprise.

8. Speech analysis: The analysis of speech signals can be defined as the process of extracting relevant information from the speech signal (i.e., from a recording). This process is mainly based on the speech production mechanism, whose study involves multiple disciplines from linguistics and articulatory phonetics to signal processing and source coding

9. AI to detect emotions from facial expressions.

10. Facial Emotion Recognition (FER): Facial Emotion Recognition (FER) is the technology that analyses facial expressions from both static images and videos in order to reveal information.

B. ENTITY USED

1. Registration: registration verifies candidates' identification and register accounts for them in the system.

2. User: candidates own no accounts in the system. candidates are provided with system accounts after authentication of email id cards by database. candidates can then use their account to log into the system during the preparation. a list of candidates who run for election (including their personal information) is stored in the system database.

3. Virtual Video bot.

C. **PHASES**

1. Homepage: Virtual assistant mock interviewer is a virtual interviewer in which user interacts with the chat bot and practices for the upcoming interviewers. Hence, we have kept a login form which is simple and easy to use. The candidate comes and register his/her mail id and user name. User name is just a candidate's name. And when the user clicks the register button, he/she enters the next page that is the stream selection page. Candidates entered are stored within the database.

2. Stream selection page: A virtual assistant mock interviewer is a practice interview website for the candidate's upcoming interview. The aim of this website is to train the students of different branches. Here the candidates click to the respective branch and enters the subject selection page.

3. Subject selection page: The subject selection page is basically the subjects that are associated with the streams.

4. AI based screen check: Here comes our assistance asking the question. There are view instruction such as :
   1. turn on your video: for face-to-face interaction.
   2. wear formals: with the artificial intelligence the assistance will get to know if the candidate is wearing the formals or not.

5. Everything is set to go:
   The chat bot window begins and the mock interviewer is ready to begin with the learning procedure.

   6. Project report:
   At the end of the interview with the assistance the candidate will get to see his/her score whether he is good or needs to prepare more. Basically, the candidate gets a chance to improve himself for the upcoming interviews.

D. **SYSTEM DESIGN**

In this chapter, the processes involved in designing the application for VMIA, namely, the architecture, its individual components, and the data that goes through the system, will be explained in detail. In addition, the minimum hardware requirements, target users, and software requirements will also be discussed.

1.1 Functional and Non-functional Requirements. The system's functional requirements are in two phases: the virtual mock interview phase and the virtual

mock interview assistant Administrators' phase. In the virtual mock interview phase, they shall be able to chat with an assistant, request for preparations for the interview, request some most important questions to be asked in the interview, have a visual discussion with the assistant, and know the result of the discussion in the form of a report card. In the virtual mock interview assistant Administrators phase, they shall be able to log in via the administrators' portal, update the chat bot database with the current qualification, and get a list of questions.
   the Non-functional requirements include the following:
   (1) Security: unauthorized users will not be provided any access to the system.
   (2) Usability: the proposed system is easy and handy for the user to operate, enter data, and interpret the output
   (3) Scalability: the system should perform adequately at all times regardless any updates
   (4) Compatibility: the proposed system is compatible with all web browsers.

   1.2 Minimum Hardware Requirements. the minimum hardware requirements refer to the computer's physical features required to implement the virtual mock interview assistant. the features are as follows: at least 250 GB HDD, 4 GB RAM, and at least Intel Pentium Dual-Core.

1.3 Software Requirements. these are the computer programs and procedures required to implement the virtual mock interview assistant.

Table below indicates the minimum software requirements.

Requirements	Software

Operating system	Microsoft windows
DBMS	My SQL
Programming language used	HTML and CSS
Development tool	Visual studio code

Table 1: minimum software requirements.

1.4 Target Users: the VMIA primary target users are the candidates preparing for interview in multiple companies for recruitment(placement), particularly the students because they look forward for a job after completion of any course. In addition, the students are the most frequent interviewee of the placement
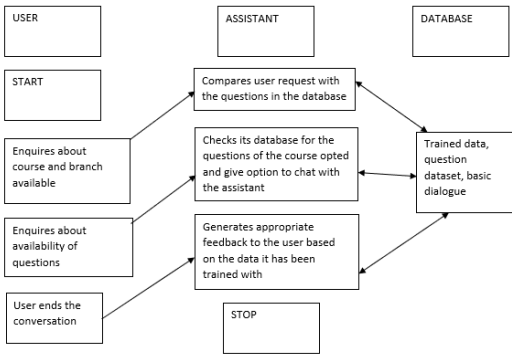activities and will, therefore, appreciate the implementation of an   virtual help for candidates.

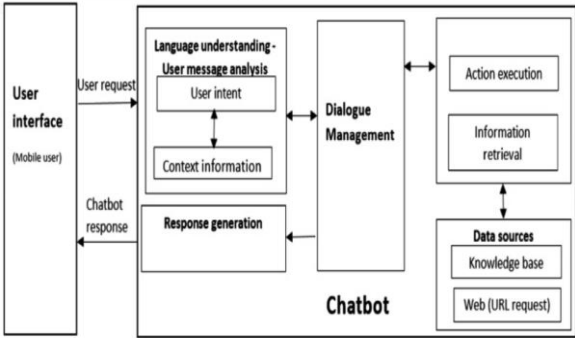Figure 1: activity diagram of VMIA

Figure 2: data flow diagram of VMIA

CONSTRUCTION, TESTING, AND RESULTS

The virtual interview system has two user interfaces and two sections, namely, the admin section and User section. the assistant system is a web application that is further divided into two parts:
(i)the front-end: it consists of the chat bot and Admin web pages
(ii)the back-end: it consists of the database section that keeps the entire system functionality.

1.1 Chat bot Page: the assistant interface where the user-to-assistant interaction occurs. the assistant interface is where candidates can fully interact with the assistant and get correct and up-to-date responses.

1.2 VMIA Admin Login Page and Admin Portal: the admin person willing to prepare for the

interview inputs the personal details. the admin persons' authentication will be done via the VMIA Admin Login Page.

Are you ready to begin for the interview

Username :
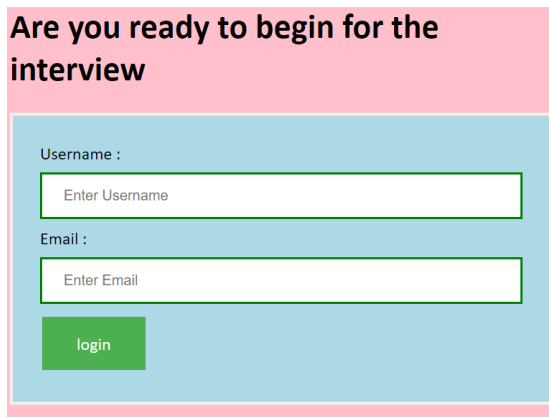
Enter Username

Email :

Enter Email

login

Figure 3: Front End Form for User Entries.

1.3 Developed using MySQL, the data layer gives a structure to the question data sets that the assistant will use to provide the report card. this structure, which is in the form of tables, will help the administrator(s) of VMIA put the relevant information in the right question.

1.4 Testing. Some of the basic software testing methods deployed are functionality, interface, database, compatibility, unit, and pilot tests to test the chat bot web application system.

1.5 Functionality Testing. The system was tested for functionality as it was being built to ensure that it performs as required. For the front-end section, the user interface was tested for proper responses. Testing the data processing part of the chat bot system involved observing the output data to ensure that they met the specified requirements.

1.6 Interface Testing. Particular areas were considered at the interface testing stage, namely:

1) Web application: Tests were carried out to ensure that requests were sent correctly to the message back end. the client side's output was Web Server. The web server was monitored to ensure that all requests were handled properly without service denial

2) Database server: Inspections were carried out to ensure that all queries to the database gave the expected result

1.7 Database Testing. the database is a very critical part of a web application. Assessments were carried out to ensure data integrity while creating, updating, or deleting data in the database and the correct display of data retrieved from the database on the web application.

1.8 Compatibility Testing. This is the stage where the web application was tested for browser compatibility. the main browsers used for the test were Google Chrome, Mozilla Firefox, and Internet Explorer. this test ensured that the web application was displayed correctly in all of the above-stated web browsers.

1.9 Unit Testing. Individual units of software developed were tested to validate that each branch of the software performs as designed.

1.10 Pilot Testing. Pilot testing is a vital part of any web-based project, and it is usually carried out by the tester or a small focus group. In this testing stage, the locally hosted web application was shown to many people to test the chat bot and ensure that all buttons and system functionalities on the site were visible and working correctly.

OUTCOMES

 • User gets a vivid and clear report that specifies all skills and personality traits specific to interview.
 • User will be able to identify their weak points.
 • User get suggestions to prefer what suits them best according to their strengths.
 • User will gain interview experience prior to any real interview.
 •

User will get aware of the ethics to be followed during an interview
  • User will get productive and will save time after having known about
weak points.

  • User will be able to upgrade/enhance the skills and increase the chances
of being recruited.
  • User will be able to make right career choice, which will be optimum
in every aspect such as work life balance, productivity and expected career
growth.
  • User will be able to improve well, due to accurate and reliable description
of the report.

CONCLUSION

Virtual assistant mock interviewer is one of the simplest way to transport data from a computer without having to think of proper keywords for a student to search or browse several web pages to collect information for an interview.
Virtual assistant mock interview is simply a chat bot. A chat bot is a great tool for quick interaction with the user. They helped us by providing entertainment, saving time and answering the questions that are hard to find. The chat bot must be simple
and conversational.

In this project we logged into how they are and the applications of Chat bot in various fields and hence selected the field for the candidate to practice for the interviews.

Students can easily ask their queries in natural language and in return the interviewer provides the information
Candidates need to interact with the virtual assistant mock interview to practice for their upcoming interviews
The gentle purpose of virtual assistant mock interview is simple user-friendly easily understood and the knowledge base must be compact
The model of multi-turn dialogue and the analysis of sentiment recognition is being combined in developing chat bots in this study. That is it will be developed to be used in the day to day conversations rather than the specific time. In future, this model is to be improved, so that learning for life long can be integrated and intent judgment can be served.
The model can be trained end-to-end with a simple unified language model architecture. We show that our model, powered by well-defined knowledge grounding, is able to approach human performance in some perspective, though still lagged behind when it comes to dealing with detailed knowledge or long-turn consistency.

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