Software Engineering Project

Facial Recognition software for Chatbots aimed to automate HR interviews

Identification of Problem Statement - Comparison with State of the Art

Currently, interviews are being done manually with the HR facing the person and conducting it. A panel of HR sits in front of a group of people or a person and there is a series of questions asked in order to judge them. There are many loopholes in this particular process such as:

- It is time-consuming as the number of HRs is limited so only a given number of students can be interviewed at a given time.
- There is no definite grading system, some may be marked leniently while some undergo a gruesome scrutiny. This may be done unconsciously, but whatever may be the case, this isn't fair on the interviewee's side.
- The above may also be done consciously resulting in biased selection. This must be avoided as it is not only negative for the interviewee but the company may also lose to get their hands on a great employee.
- The manner in which a HR may judge varies from person to person and hence there is a need for standardization, else, different people judged by different HRs might not always result in the best choice of people.

In order to rectify the above problem, we can make use of a chatbot with a facial recognition software in-built. The reason that chatbot is a great option since:

- Multiple people can be interviewed at a given time. The constraint here is the number of machines available for conducting interviews which generally is not going to affect the interview process.
- Since all the people are interviewed by the same chatbot having the same grading system, each gets graded by the same pattern making the judgement unbiased.
- Chatbots may register the details of the interviewee but will conduct an unbiased interview.

But with the chatbot, there is a need of a facial recognition software mainly because of:

- The same person must not be interviewed again in a given amount of time. The software must be good enough to detect if the same person is being interviewed even if his face has been altered to some extent (beard is missing or wearing spectacles).
- There is a need of emotion detection while answering of HR questions as well.
- Lastly, there is a need of means for identification of the interviewee such as for the profile.

Scope of the Project:

Will do:

- It will be able to detect and recognize the human face on the basis of some methodology such as feature detection or Node detection.
- Detection of human face must have some security features such as it is able to differentiate between actual face and photo or detect the minor changes if face has been altered to some extent.
- On the basis of a face scan, a unique data file would be created or the entries would be added to a database file. This is to be done to maintain some sort of a record.
- Hence, it will perform certain operations on data file or the database such as the emotion detection like mentioned before.
- As features, it would be able to detect emotions while the person is being interviewed as well as it can alert the admin in case of proxy or repetition by the same person.

Won't do:

- It cannot differentiate the identical twins so there will be cases of false positives.
- Face recognition would allow for minimal detection of emotions, basic ones like happy, sad, etc. Also, it will not be able to detect the body language of the person.

Stakeholders:

Direct Users:

- We are currently developing it for chatbots aimed for HR interview automation
- With certain modifications, same piece of software can be incorporated in various applications such as Face ID, lenskart, beauty apps, etc.

Secondary Users:

Considering for what it is primarily built for, it will be used for:

- Any company wanting to hire someone, generally in large number in order to make the process easier.
- It can be employed by various institutions for training purposes and help them crack such interviews as well as build their technical and non-technical skills.
- It can be used by government for various to fill various vacancies they have quickly.

Beneficiaries:

- The company that is currently developing this product for automation of HR interviews.
- All those agencies that may use their service or those companies that employ the face recognition software developed by us
- The interviewee himself will be directly affected and will benefit from an unbiased hiring process.

Requirements and SRS

Product Perspective: Takes the photo as input and then extracts the face details. These may then be stored in an individual file or be a part of a database file.

Operating Environment: The developed software is intended to work on both laptops and computers irrespective of their OS. It would be incorporated in a web app.

Design and Implementation Constraints: The software is designed by using the concepts of machine learning and data science. It will involve steps such as data gathering, data cleaning, making correlations between various parameters of the data, extracting important attributes and features of the face that are required by for detection and recognition, storing these features and additionally using it to train the machine. We intend to make the software self-learning and that improves its accuracy with every detection.

Functional Requirements:

1) It is expected that the software can easily recognize the faces of candidates who have once appeared for the HR interviews. A person's face may undergo certain facial changes overtime or could have worn certain accessories but it is still expected to correctly find a match of face from the stored file(s).
2) It is even expected that the software does some basic emotional analysis of the interviewee such as detect happiness or sadness.
3) It must provide a facility to catch an interviewee attempting to give interview more than once thus avoiding the malpractices in the selection task of candidates. This will be made possible by successfully executing point 1.
4) Time complexity of the software must be as small as possible since the detection must be fast enough to register the person for the interview and detect if he is eligible.

Non functional requirements:

1) The interface used to plug in the software must be easy and to some extent be universal to allow multiple usages of the app.
2) The software must provide a clean usable output file that is accessible by not just the software but also by the company for any of its use.
3) The interface developer must provide a tutorial or some manual showing the steps that are required to use the application. It is expected that before starting the application the software communicates with the user in the form of dialog box by listing the steps required for working with the application.