

SOEN 6751-Human-Computer Interface Design: Alpha System Demo (Group L)

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GitHub: <https://github.com/yash0208/InterviewSimulator.git>

1 INTRODUCTION

IntuitiHire is designed to simulate real-world interview scenarios, providing an engaging platform for both candidates and interviewers to prepare and evaluate. Leveraging advanced machine learning algorithms, IntuitiHire offers a comprehensive tool for interview training and analysis.

2 SYSTEM ARCHITECTURE

2.1 Frontend:

- The frontend is developed using React.js, HTML5, CSS3, and JavaScript. It provides a user interface for both candidates and interviewers to interact with the platform.
- Utilizes web browsers (Chrome, Firefox, Safari, or Edge) to render the user interface.

2.2 Backend:

- The backend is implemented using Flask, a lightweight web framework in Python. It serves as the core logic of the application, handling requests from the frontend, processing data, and interacting with the database.
- Utilizes Python for server-side logic.

2.3 Database:

- Firebase is used as the database for storing application data. It provides real-time data synchronization and scalable cloud storage.
- The backend communicates with Firebase to perform CRUD operations and manage user data.

2.4 Machine Learning Integration:

- The application leverages machine learning models from Hugging Face for analyzing text, audio, and video inputs during the mock interview process.
- Text analysis involves sentiment analysis and keyword extraction using transformer models.
- Audio analysis employs speech-to-text conversion models followed by language processing to evaluate communication skills.
- Video analysis utilizes facial recognition and emotion detection models to assess candidate engagement and reaction.

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2.5 Video/Audio Processing:

- OpenCV and PyAudio libraries are used for video and audio processing tasks. These libraries handle tasks such as capturing, processing, and analyzing video and audio data during the interview simulation.

2.6 Environment and Deployment:

- The system is designed to be cross-platform compatible, supporting operating systems such as Windows, MacOS, and Linux.
- Node.js is required for frontend development, and Python is required for backend development.

3 LOW-FIDELITY PROTOTYPE

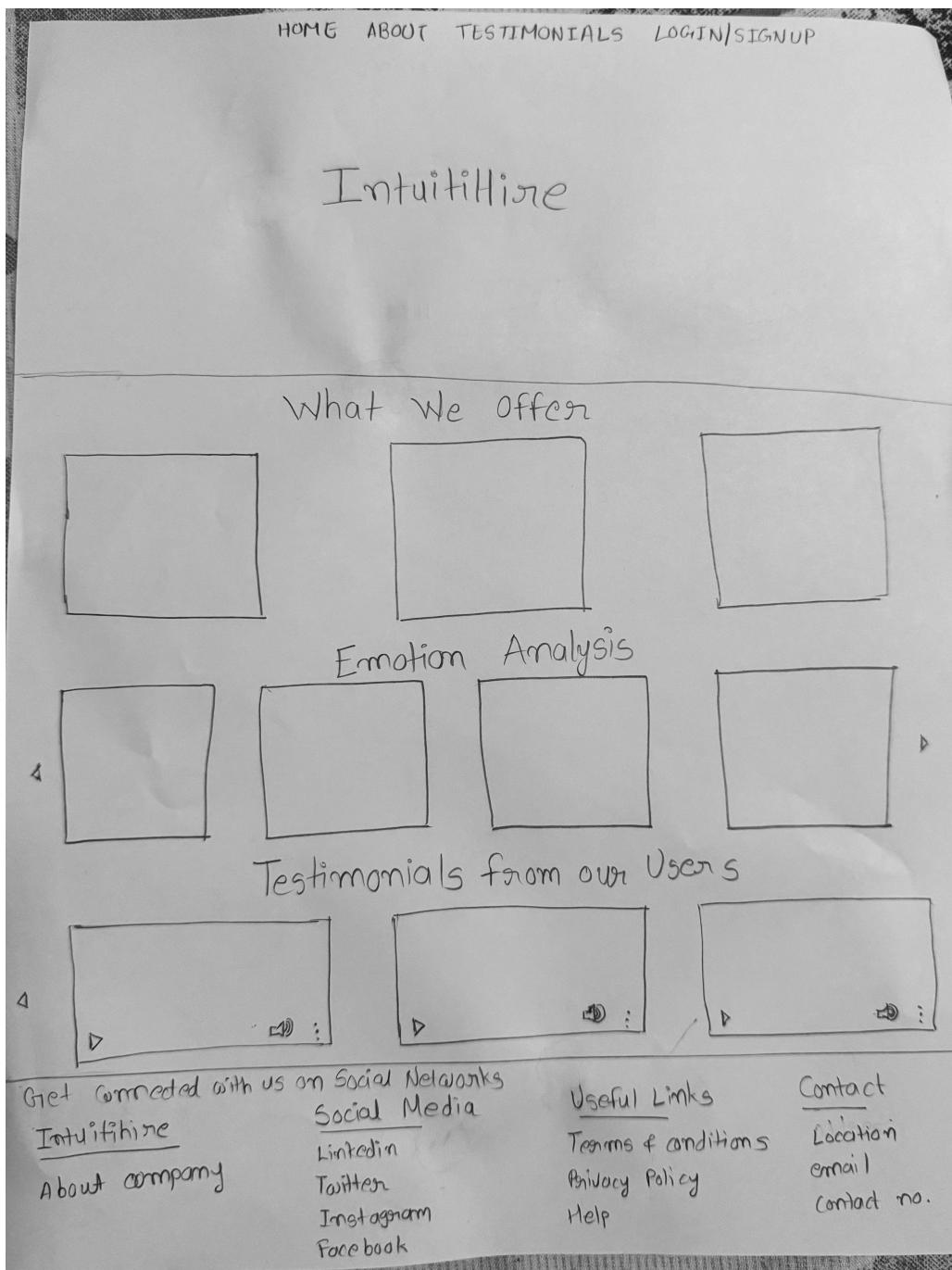


Fig. 1. Landing Page

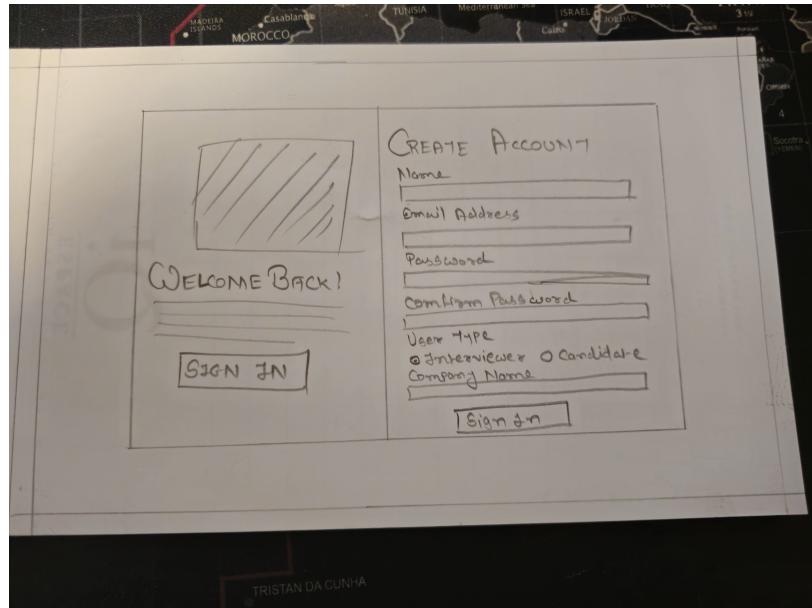


Fig. 2. Sign Up Page

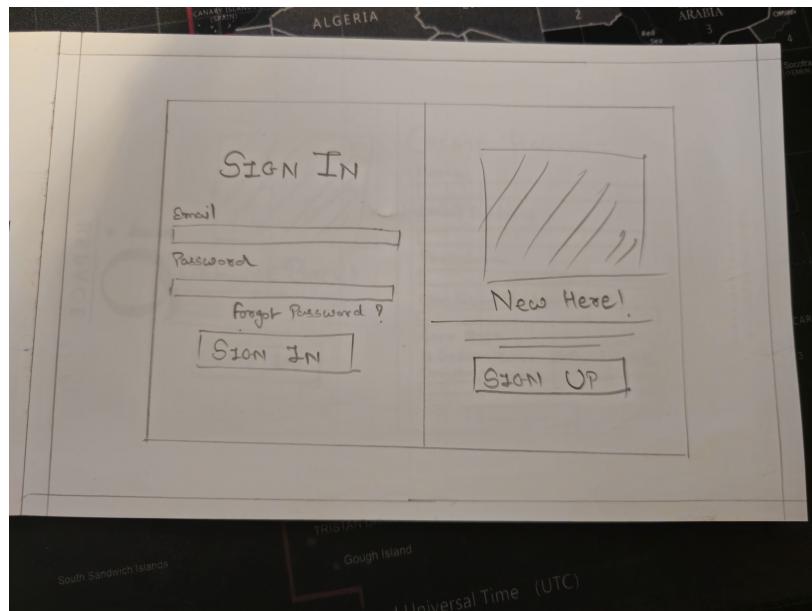


Fig. 3. Sign In Page

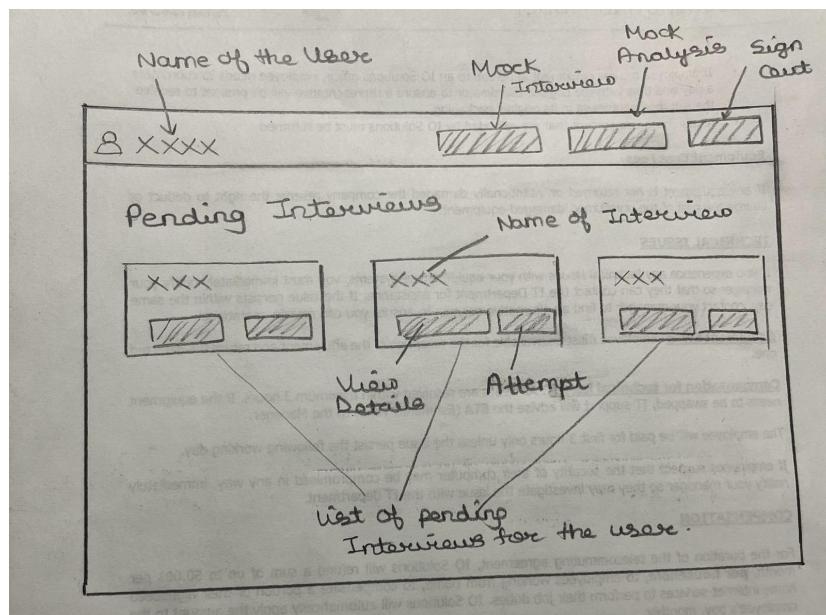


Fig. 4. Candidate Home Page

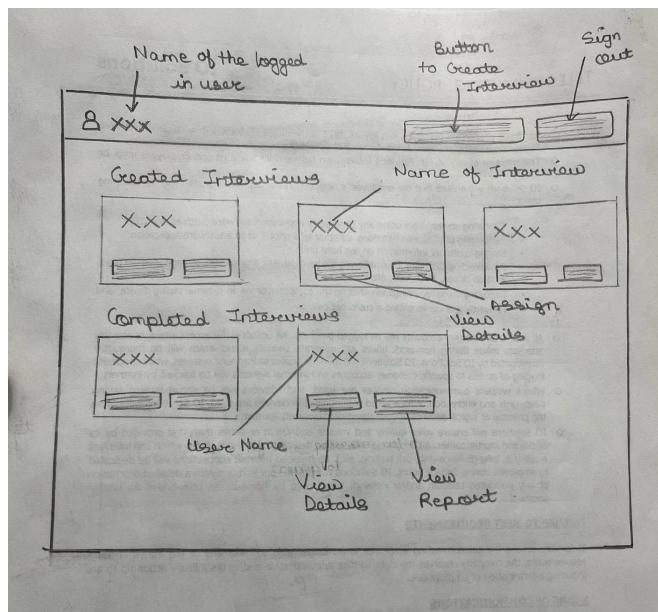


Fig. 5. Interviewer Home Page

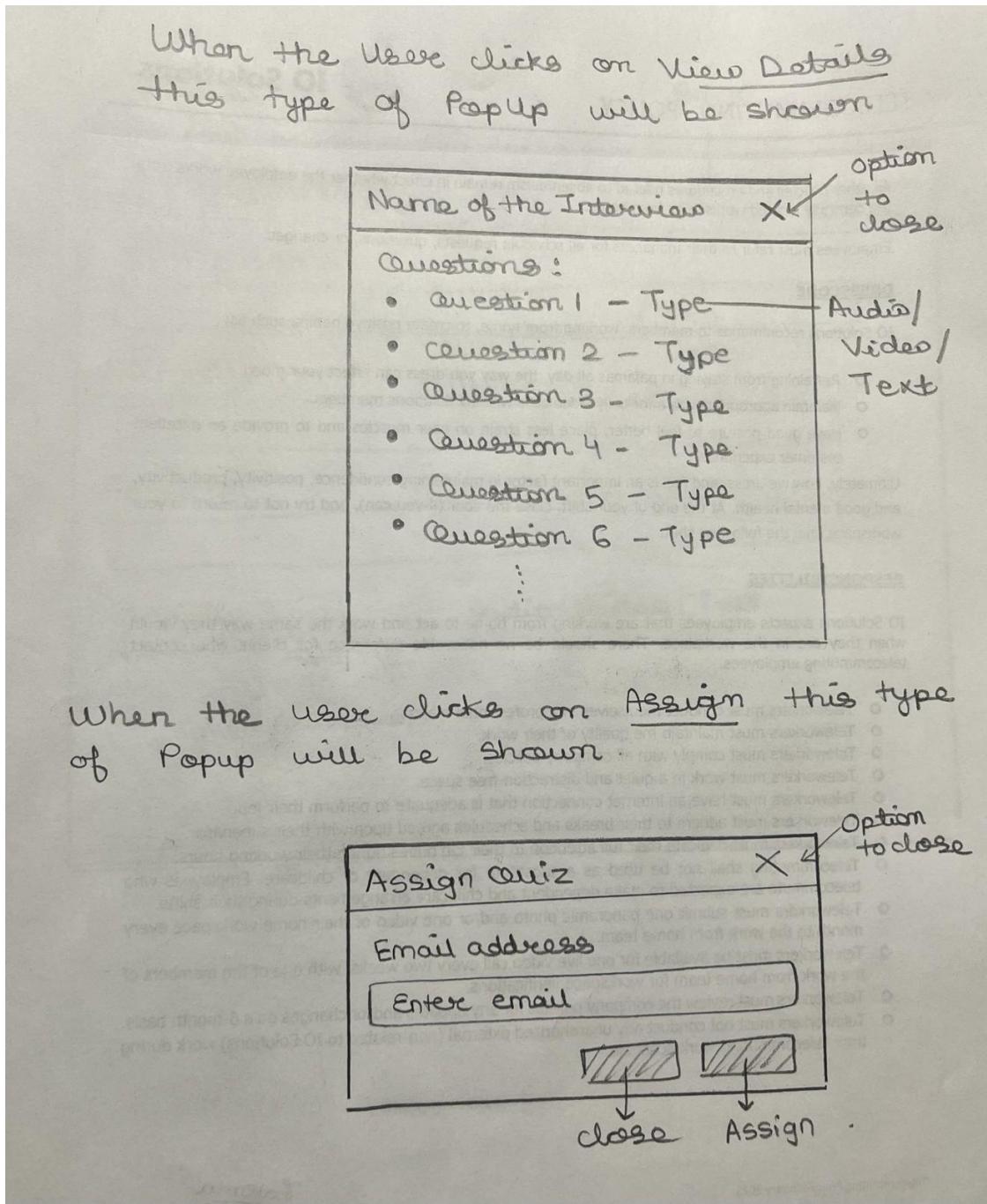


Fig. 6. Quiz Details Page

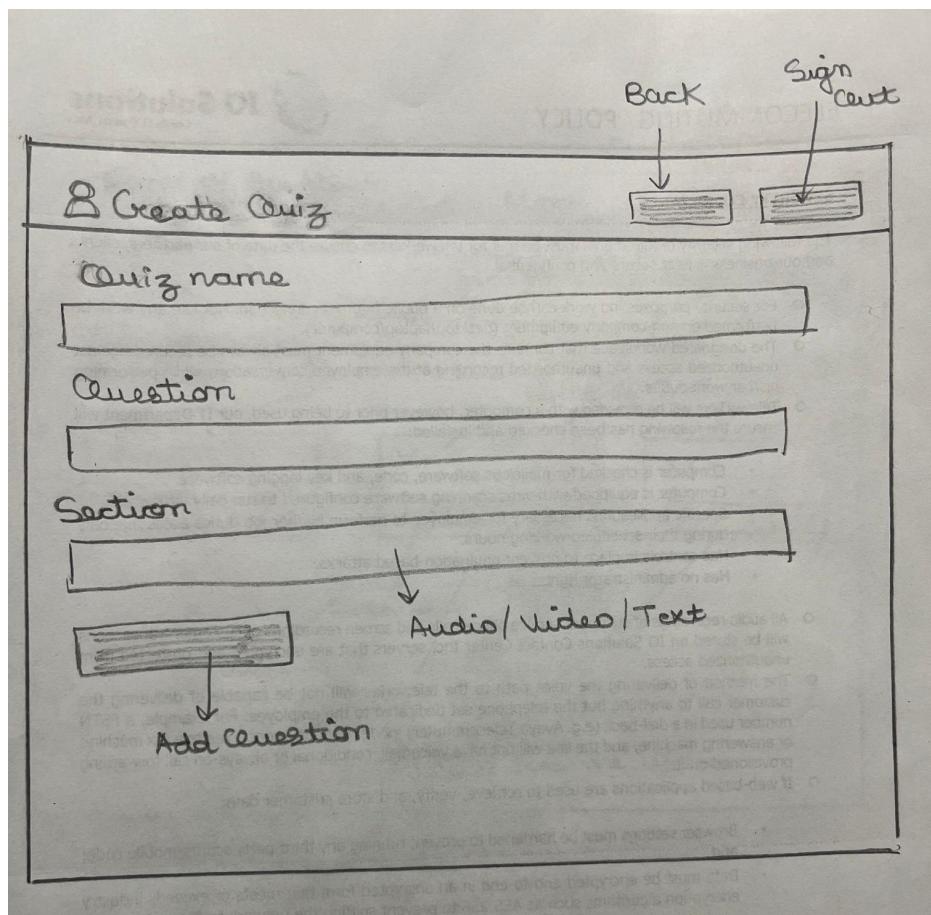


Fig. 7. Create Quiz Page

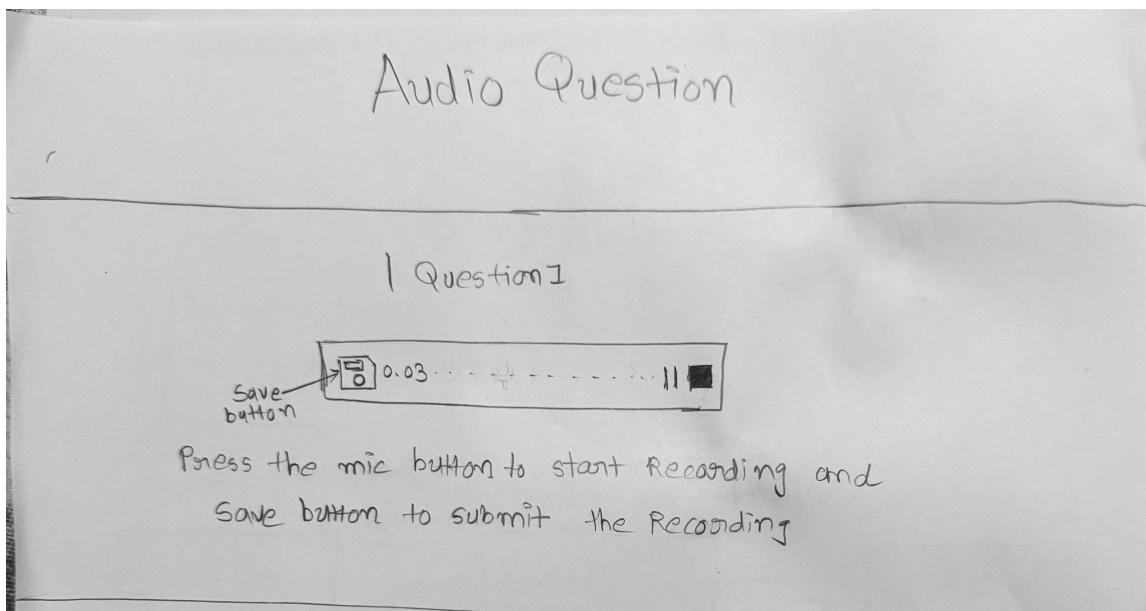


Fig. 8. Audio Quiz Page

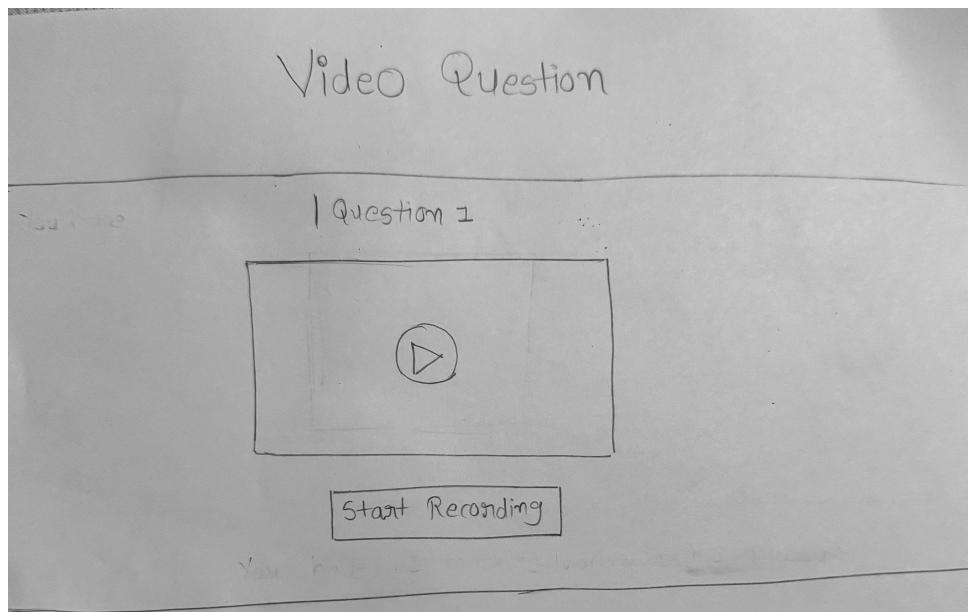


Fig. 9. Video Quiz Page

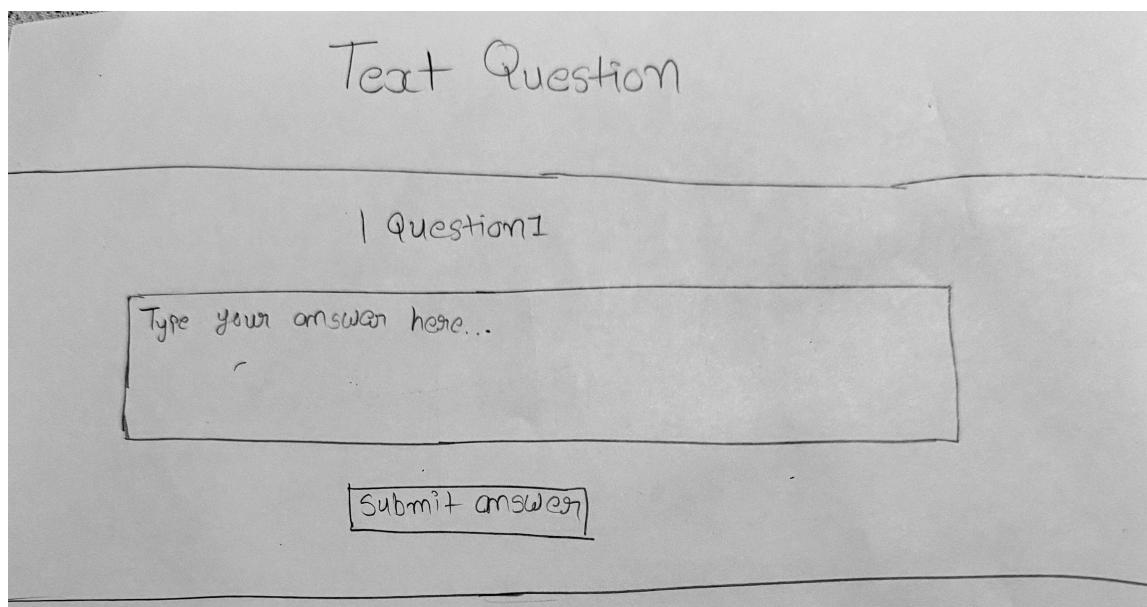


Fig. 10. Text Quiz Page

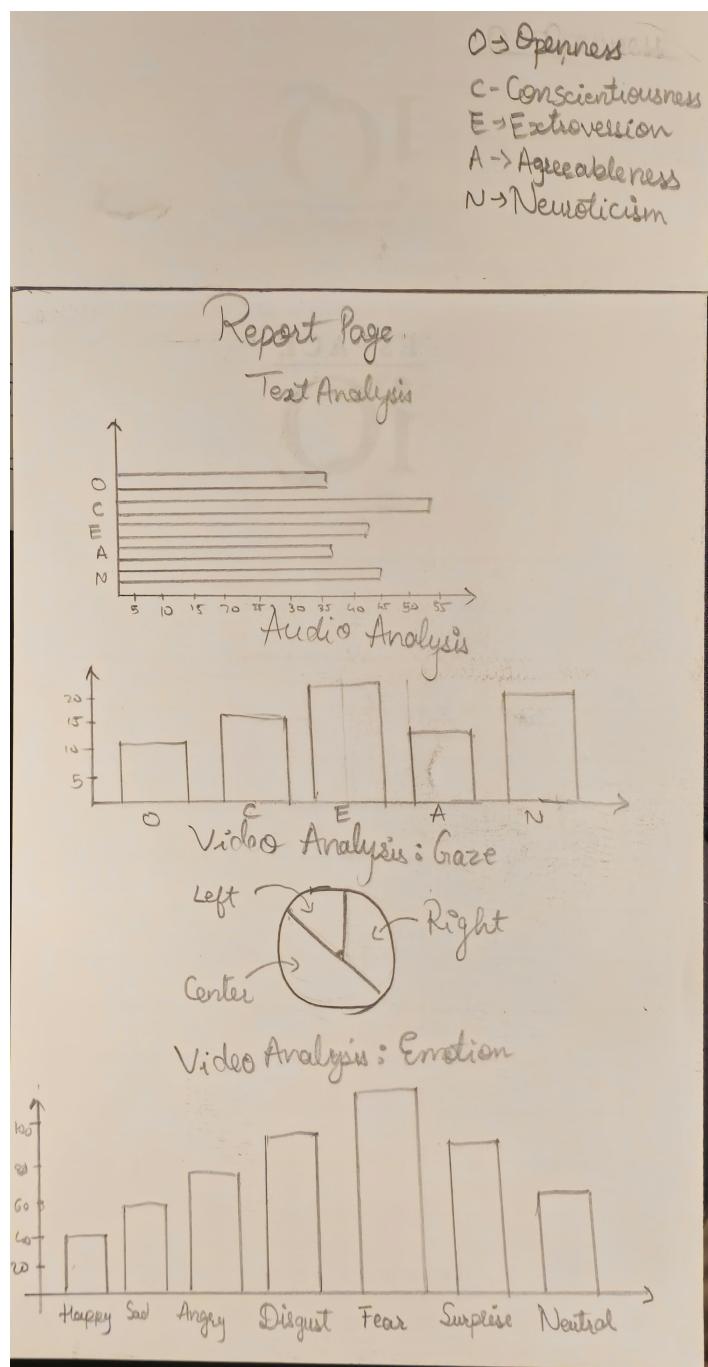


Fig. 11. Quiz Report Page

4 UI ELEMENTS AND USER INTERACTION

4.1 UI Elements:

(1) Landing Page:

Navigation Bar

Elements: Links for Home, About, Testimonials, Login/Signup.

Rationale: The navigation bar uses contrasting colours for visibility and familiarity. The choice of font and spacing between menu items ensures legibility and easy clickability, adhering to Fitts's law, which predicts the time required to rapidly move to a target area, such as a menu item.

Main Title

Elements: "IntuitiHire" displayed prominently in the center.

Rationale: The title uses a large, bold typeface, capitalizing on white space to create a focal point, aligning with the Gestalt principle of figure-ground, which dictates that objects (figures) are perceived as separate from their surroundings (ground).

Background Graphics

Elements: Overlapping colourful circles of varying sizes and colours.

Rationale: The abstract, soft-colored shapes provide a welcoming and modern aesthetic. They're designed to be visually interesting without overpowering the central message. This background could invoke curiosity and encourage users to explore further. The use of circles may symbolize completeness and community.

(2) Footer on Landing Page:

Branding Statement

Elements: A short descriptive statement about IntuitiHire.

Rationale: Solidifies brand messaging and communicates the core value proposition of the service at a glance, reinforcing the application's purpose and benefits.

Social Media Links

Elements: Links for Facebook, Twitter, LinkedIn, and Instagram.

Rationale: The alignment and spacing adhere to the grid system, providing a structured and balanced layout that meets the aesthetic-usability effect, where aesthetically pleasing designs are often perceived as easier to use.

Useful Links

Elements: Links for Terms and Conditions, Privacy Policy, and Help.

Rationale: Presented in a clear, minimalistic style with a sans-serif font for easy reading. The hover effect subtly indicates interactivity, a principle of affordance in UI design.

Contact Information:

Elements: Address, Email, and Phone Number.

Rationale: This section uses hierarchy to prioritize essential contact methods. Adequate line-spacing (leading) improves readability and visual comfort.

(3) **Testimonials Section with Playable Videos:**

Video Thumbnails

Elements: Small preview images that represent the video content.

Rationale: Thumbnails serve as a visual summary of the video content, making it easier for users to decide whether they are interested in viewing them. The human aspect in these thumbnails can increase relatability and trust.

Testimonial Title

Elements: A heading that reads "Testimonials from our users".

Rationale: The heading is clear and direct, which helps users understand that the section contains feedback or experiences from other users, adding credibility to the platform.

Carousel Functionality

Elements: Arrows on the sides and dots at the bottom indicating additional content.

Rationale: The carousel format allows for multiple pieces of content to occupy the same space on the page, making efficient use of the layout. The navigation aids imply there's more to explore, invoking curiosity and interaction.

(4) **Emotion Analysis Section with Moving Images:**

Dynamic Cards

Elements: Cards with motion graphics or video loops displaying various emotions.

Rationale: Motion attracts attention more than static images. Showing the platform's emotion analysis feature in action, these cards serve as a demonstration of the product's capabilities, increasing user interest and understanding of the service provided..

Emotion Percentages

Elements: Percentage values next to emotion labels on each card.

Rationale: Quantitative data supports the visual information, giving users a clear and measurable insight into how the system evaluates emotions, which adds to the analytical appeal of IntuitiHire.

Question Prompt

Elements: Sample interview questions on each card.

Rationale: Contextualizes the emotion analysis by linking it to a typical interview scenario. This not only showcases functionality but also helps users envision how the tool can be used in real situations.

(5) **Sign Up Page:**

Header Graphic and Welcome Message

Elements: An illustration of a phone with various avatars and a "Welcome Back!" message.

Rationale: This friendly graphic and message are designed to create a sense of belonging and continuity. It reinforces that the user is returning to a familiar place and that their journey towards successful interviews continues with IntuitiHire. The use of inclusive avatars can also suggest diversity and personalization.

Input Fields for Account Creation

Elements: Text fields for "Name", "Email Address", "Password", and "Confirm Password".

Rationale: These are standard fields necessary for account creation. They are clearly labeled and laid out in a logical sequence that follows the natural flow of information a user would provide. The use of placeholder text (e.g., "Enter Your Password") provides subtle guidance on what information goes into each field.

User Type Selection

Elements: Radio buttons labeled "Interviewer" and "Candidate".

Rationale: This allows the user to specify the type of account they are creating, which customizes the subsequent experience on the platform. It's a simple decision point that has significant implications for the features and options available to the user once they're logged in.

Sign Up Button

Elements: A prominent "SIGN UP" button.

Rationale: The button is designed to stand out with its bold color and placement, serving as a clear call-to-action. It's the final step in the account creation process and is made visually important for the user to take action.

Visual Design and Layout

Elements: Split-screen design with a graphic.

Rationale: The split-screen design with a graphic on one side and the form on the other uses space efficiently while also keeping the interface from being too text-heavy. The color palette is consistent with the brand's theme, and the use of whitespace around the form fields helps to reduce visual clutter, making the form appear less intimidating and more user-friendly.

Sign In Redirect

Elements: A "SIGN IN" link within the welcome message.

Rationale: For users who already have an account and have navigated to this page by mistake, the sign-in link provides a quick way to redirect to the correct entry point without having to search for the login option.

Contextual Graphics

Elements: Illustrations depicting user types.

Rationale: Illustrations use a friendly, inviting style with a colour scheme that reduces user-anxiety, conforming to the principle of colour harmony for visual appeal.

(6) Login Page:

Email and Password Input Fields

Elements: Designated areas for users to enter their email and password.

Rationale: These are fundamental for the security and personalized access to the system. The email acts as a unique identifier, while the password ensures that access is granted only to authorized users.

'Forgot your password?' Link

Elements: A clickable text link for users who have forgotten their password.

Rationale: This serves as an aid for users to recover their accounts. It's a necessary feature to help users who might otherwise be locked out, ensuring they can regain access without undue stress or inconvenience.

Sign In Button

Elements: The button to submit the login credentials.

Rationale: Its placement and contrasting color make it stand out as the next step after filling in the credentials. The button is designed to be immediately identifiable as the action to take to access one's account.

Illustration and Sign-Up Call to Action

Elements: Graphic illustration with diverse avatars and a 'New Here!' section with a 'SIGN UP' button.

Rationale: This serves a dual purpose. The illustration adds a friendly, welcoming touch to the page, while the 'SIGN UP' section directly appeals to new users to join, clearly delineating the path for registration. This can help convert visitors to registered users.

Consistent Branding

Elements: Branding Image.

Rationale: The use of color, typography, and imagery remains consistent with the brand's aesthetic established on other pages. This consistency across the platform helps in reinforcing brand recognition and provides a seamless user experience.

Responsive Design

Elements: Responsive layout.

Rationale: The layout appears to be responsive, ensuring that the elements rearrange themselves gracefully across different devices and screen sizes, providing an accessible and user-friendly interface regardless of how the user accesses the page.

(7) Candidate's Dashboard:

Pending Interviews Section

Elements: Interview tiles with 'View Details' and 'Attempt' buttons.

Rationale: Each interview tile is a card design with shadow effects, creating a sense of depth and making the interactive elements 'pop out'. This is aligned with the principle of skeuomorphism, where items resemble their real-world counterparts.

Top Menu

Elements: Options for Mock Interview, Mock Analysis, and Sign Out.

Rationale: The menu's design and colour differentiation help in identifying active sections, a practice that aids

user orientation within the application, reducing cognitive load.

(8) **Interview Creation Page:**

Input Form

Elements: Fields for Quiz Name, Question, and Section.

Rationale: The form fields employ a minimalist aesthetic with ample white space to reduce user overwhelm, and placeholder text employs a lighter colour, distinguishing it from user input.

Add/Save Buttons

Elements: Buttons for adding questions and saving the quiz.

Rationale: Buttons are sized for easy interaction, with colour coding that intuitively leads to a primary and secondary action, a common practice in UI to guide user behaviour.

(9) **Report Pages:**

Graphical Reports

Elements: Bar and pie charts for Text, Audio, and Video Analysis.

Rationale: Charts use colour coding to differentiate between user and general data, a technique that improves quick data assessment. The use of familiar chart types adheres to Jakob's Law, where users prefer the site to work the same way as all the others they're familiar with.

Section Headers

Elements: Labels such as "Text Analysis" and "Video Analysis: Gaze".

Rationale: Clear sans-serif typography is used for headers for easy scanning, following the principle of typographic hierarchy, aiding in content organization and quick navigation.

(10) **Text:** Clear, concise labels are critical. They should be descriptive without being verbose, aiding in usability and accessibility.

(11) **Colours:** They are chosen not only for aesthetic appeal but also for readability and accessibility. Colour contrast ratios should meet WCAG guidelines (<http://web-accessibility.carnegiemuseums.org/design/color/>), ensuring readability by users with visual impairments.

(12) **Spacing:** Generous spacing around elements (margins and paddings) enhances the user experience by allowing the interface to breathe and reducing cognitive load.

The UI elements in IntuitiHire are designed with a clear and user-friendly approach. The rationale for each element ties back to the goal of providing a seamless, intuitive experience that encourages user engagement, provides clear navigation, and presents information in a digestible format. The elements are visually distinct but functionally integrated to support a cohesive user journey from landing on the page to completing interviews and reviewing feedback.

4.2 User Interaction:

Candidate User Flow:

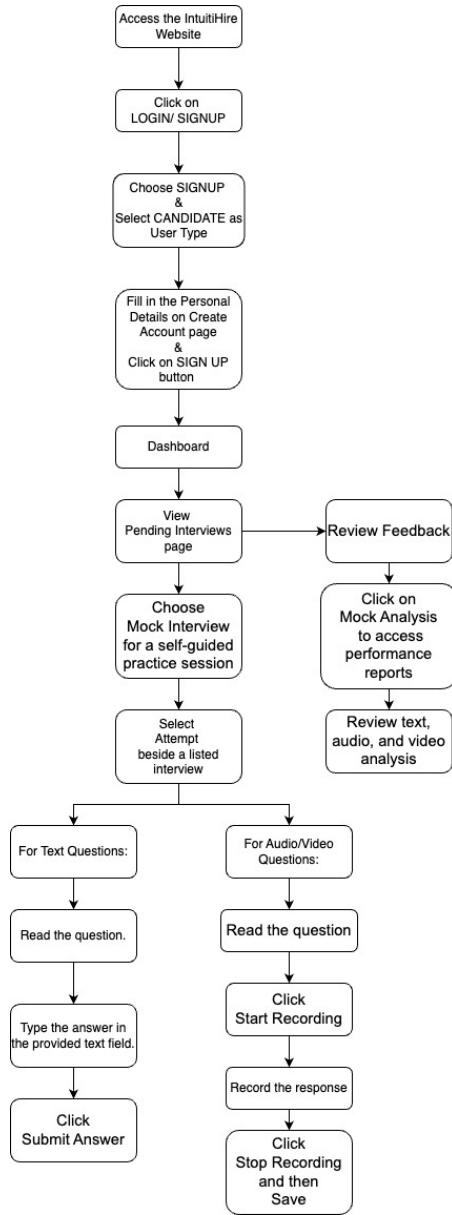


Fig. 12. Candidate User Flow

Interviewer User Flow:

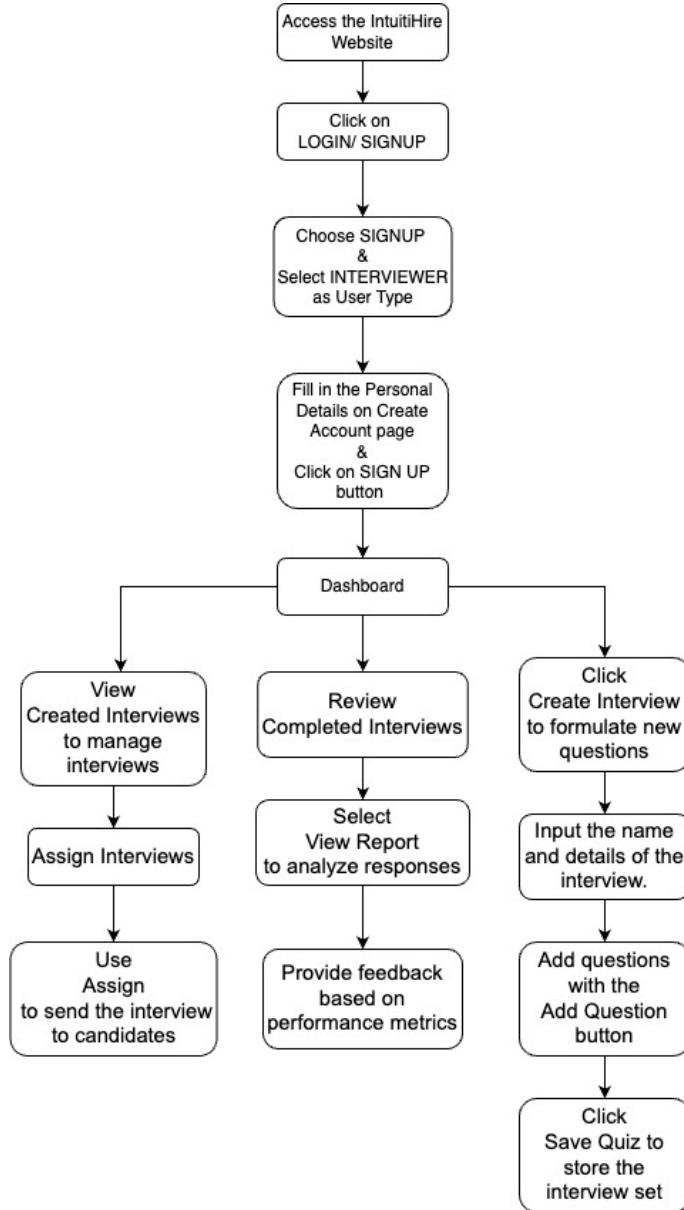


Fig. 13. Interviewer User Flow

5 FEEDBACK MECHANISM

After completing an interview session, users receive a detailed feedback report that includes analysis from various modalities, such as text, audio, and video. This report is presented in the form of bar graphs and pie charts, making it easy for users to interpret and understand their performance across different parameters. The visual representation of data enables users to identify areas of strength and areas for improvement quickly.

Machine learning algorithms are employed to analyze the text, audio, and video inputs provided by users during the interview. These algorithms extract relevant features, such as emotional tone, personality traits, and engagement levels, from each modality. By leveraging machine learning, the system can generate accurate and insightful feedback tailored to each user's interview performance. By leveraging machine learning, the system can generate accurate and insightful feedback tailored to each user's interview performance.

6 RESULTS AND DISCUSSION

Analyzing the effectiveness of IntuitiHire in improving interview skills based on the user feedback, we notice some important things:-

- **Realistic Simulation:**

Users appreciated IntuitiHire's realistic interview simulation, indicating that the system effectively emulates real-life interview scenarios. This realism allows users to practice their interview skills in a manner that closely resembles actual job interviews, providing valuable experience and helping users become more comfortable and confident in real interview settings.

- **Tailored Guidance:**

Users found the personalized guidance offered by IntuitiHire to be beneficial. The system's ability to analyze individual interview performances and provide specific recommendations based on personality traits and emotional expressions demonstrates its effectiveness in offering targeted support to users. This tailored approach ensures that users receive relevant feedback that addresses their unique strengths and areas for improvement, enhancing the effectiveness of their interview practice.

- **Confidence Boost:**

IntuitiHire significantly boosted users' confidence going into real job interviews. The opportunity to practice multiple attempts for specific questions allowed users to refine their responses and feel more prepared. Additionally, receiving constructive feedback from the system assured users that they were adequately prepared, contributing to their overall confidence during interviews.

- **Enhanced Self-awareness:**

Users noted that IntuitiHire helped them become more self-aware of their interview habits and tendencies. The system's detailed analysis of emotional expressions and engagement provided users with valuable insights into how they were perceived by potential employers. By understanding their strengths and areas for improvement, users were able to adapt their approach and present themselves more effectively during interviews, indicating an increase in self-awareness and interview skills.

- **Interactive Learning:**

Users found IntuitiHire to be engaging and interactive, which contributed to their overall learning experience. The system's user-friendly interface and variety of features, such as mock interviews and real-time feedback,

kept users motivated to practice. This interactive learning environment fosters active engagement and enhances users' retention of interview skills, making the learning experience enjoyable and effective.

7 DEMONSTRATION AND FEEDBACK INTEGRATION

During the demonstration, we aimed to effectively communicate the capabilities of our system, which utilizes advanced AI to enhance the interview experience and prevent cheating. We emphasized several key points:

- **Multimodal Emotion Recognition:**

We highlighted how our project goes beyond traditional methods by analyzing candidates' emotional expressions through text, sound, and video inputs. This comprehensive approach ensures a fair and inclusive interview process.

- **Comprehensive Analysis:**

Unlike existing tools that focus on single-mode analysis, our project integrates all three inputs to provide a holistic view of each candidate. This includes personality assessments, emotion tracking, and engagement analysis, providing valuable insights for employers and candidates alike.

- **User-Friendly Experience:**

We emphasized the importance of creating a user-friendly interviewing experience. Our system offers real-time feedback, personalized guidance, and recommendations tailored to candidates' personality traits and interview performance. Feedback from the marker highlighted the need for improvements in certain areas:

- **Multiple Recording Attempts:**

The marker suggested incorporating an option for candidates to practice and record multiple attempts for specific questions, such as introductions. This would allow candidates to improve their responses and ensure a fair assessment.

- **Transparency on Attempts:**

It was suggested that the number of attempts made by candidates for each question should be shared with both the candidate and the interviewer. This transparency would provide valuable information and could be highlighted in the feedback report.

- **Option for Interviewers:**

The marker recommended providing interviewers with the option to allow multiple attempts for certain questions while restricting them for others. This flexibility would enhance the adaptability of the system to different interview scenarios.

8 CONCLUSION

Based on the extensive analysis and development presented, it is evident that IntuitiHire offers substantial benefits for interview preparation. By leveraging cutting-edge technologies such as real-time emotion analysis, personality trait extraction, and multimodal assessment, IntuitiHire enhances the interview process for both employers and candidates.

One of the primary advantages of IntuitiHire is its ability to provide immediate insights into candidates' emotional responses, personality traits, and engagement levels during interviews. This real-time feedback enables interviewers to adapt their strategies on the fly, leading to more effective communication and decision-making.

Also IntuitiHire's comprehensive approach which integrates text, audio, and video analysis, ensures a holistic understanding of each candidate. By considering multiple modalities, IntuitiHire provides valuable insights that go beyond traditional interview assessments, allowing employers to make more informed hiring decisions.

There are several potential enhancements for future iterations of IntuitiHire in addition to current capabilities. These include improving the accuracy and robustness of emotion and personality recognition models, enhancing the user interface for better usability, and expanding the range of actionable insights and recommendations provided to users.

In conclusion, IntuitiHire represents a significant advancement in interview preparation technology, offering a sophisticated yet user-friendly solution for both employers and candidates. With ongoing development and refinement, IntuitiHire has the potential to further revolutionize the recruitment process and set new standards for interview assessment tools.

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