

SignIfy: Where Gestures Speak Louder than Words

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A cartoon illustration of a character with large black hair and a blue shirt, holding a globe. The globe shows continents in blue and green. There are yellow speech bubbles around the character's head.

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Introduction to SignIfy: "Bridging the Gap in Communication"

Communication is a fundamental human right, yet millions of hearing-impaired individuals face daily challenges in expressing themselves and understanding others.

SignIfy is an AI-powered mobile application designed to:

- Facilitate seamless, real-time communication between sign language users and non-signers.
- Leverage AI, computer vision, and speech recognition to create an inclusive, accessible solution.
- Enhance interaction and independence for the deaf and hard-of-hearing community.



Problem Statement: The Communication Barrier

Despite the increasing awareness of inclusivity, communication barriers remain a major obstacle for the deaf and hard-of-hearing community.

Traditional solutions, such as human interpreters or static sign language dictionaries, are often limited, expensive, and impractical for real-time conversations.

The lack of effective sign language recognition tools prevents smooth communication in daily life, education, and workplaces, reinforcing isolation and dependency.



Purpose: Breaking Barriers with AI

Signlfy aims to break communication barriers by offering a real-time, AI-driven translation platform that converts sign language into speech.

By integrating gesture recognition, speech-to-text, and text-to-speech technologies, the app empowers hearing-impaired individuals to engage in conversations effortlessly.

Our mission is to foster inclusivity, independence, and accessibility for a more connected world.



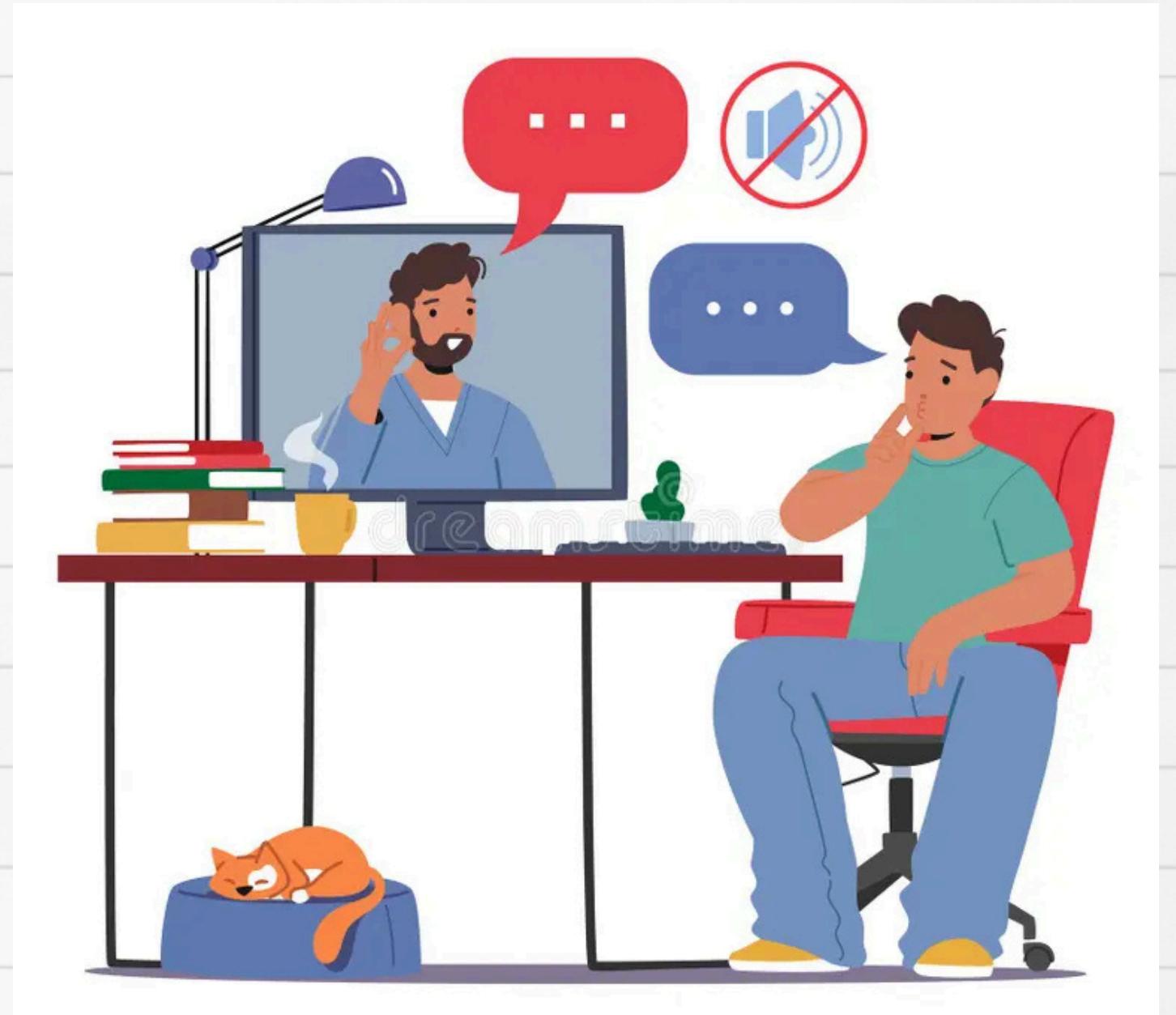
Contemporary Solutions

FEATURES	HANDTALK	SIGNALL	MICROSOFT TRANSLATOR	DEAF-TALK
Real-time Sign Detection		✓		
Gesture-to-voice Translation		✓		✓
Full sentence recognition		✓		✓
Multilingual Support	✓		✓	✓
Speech-to-text			✓	✓
Text-to-speech			✓	✓

Main Features of Signify:

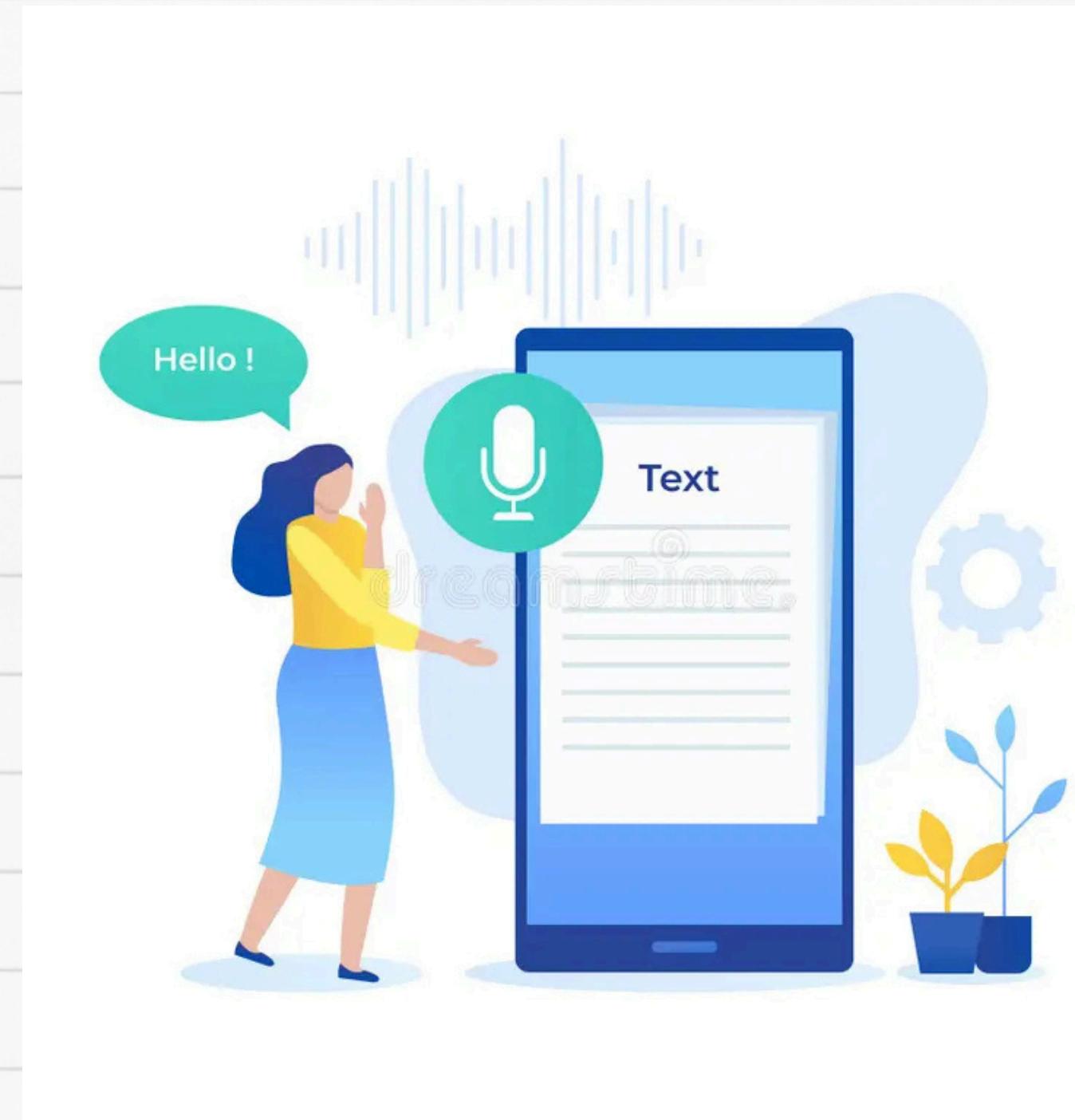
1. Real-time Sign Language Detection

- Signify utilizes **MediaPipe** for real-time hand tracking and **SPOTER** (Sign Pose-based Transformer) for dynamic gesture recognition.
- This allows the app to capture hand movements and translate them into text or voice output almost instantly, facilitating natural, fluid communication.



Main Features of Signify:

2. Integrated Speech and text translation



- Signify supports both **text-to-speech (TTS)** and **speech-to-text (STT)** functionalities to facilitate two-way communication.
- **STT** converts spoken language into text for **hearing-impaired users**, while **TTS** transforms text or recognized gestures into speech, aiding **speaking-impaired users** in expressing themselves.

Main Features of Signify:

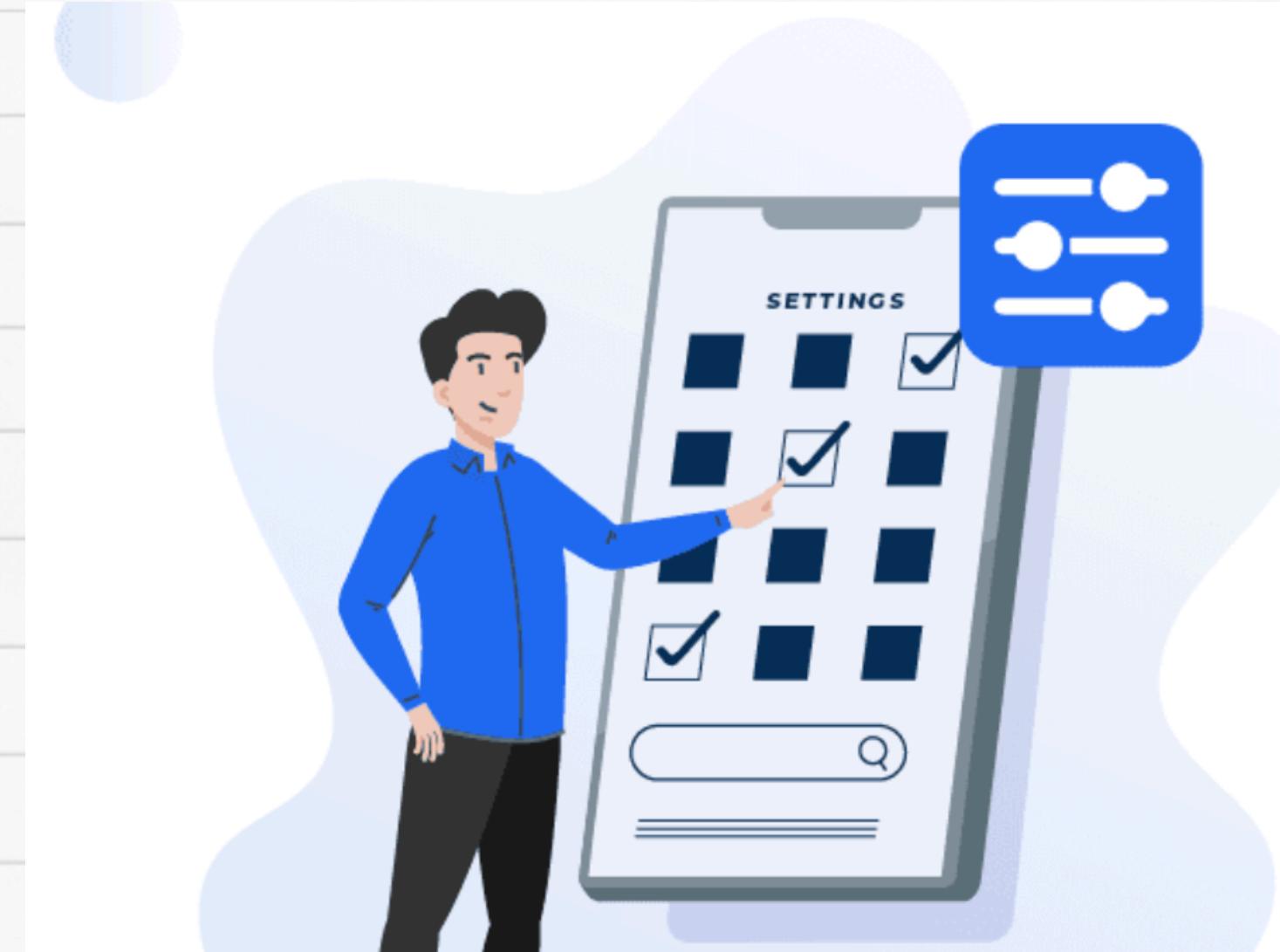
3. Full Sentence and Phrase Recognition

- Unlike traditional applications that recognize isolated signs, Signify employs **Transformer-based models** to understand full sentences and phrases. This ensures that the meaning and context of conversations are accurately preserved.



Main Features of Signify:

4. Customizable Communication Preferences

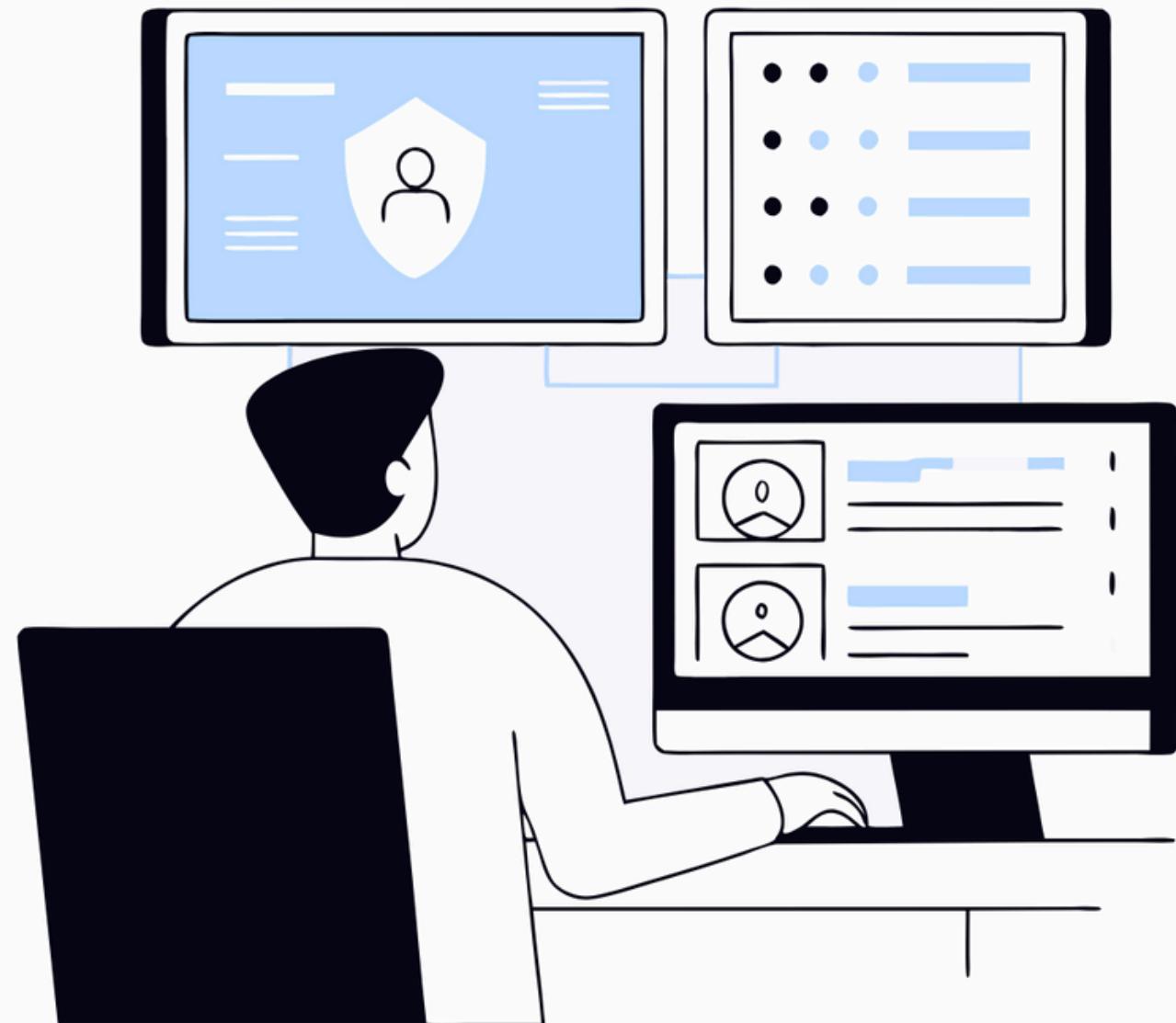


- Users can personalize their experience by adjusting **voice** and **text settings**, selecting **preferred sign language**, and submitting **feedback** for continuous improvement.

Main Features of Signify:

5. Admin Panel for User Management

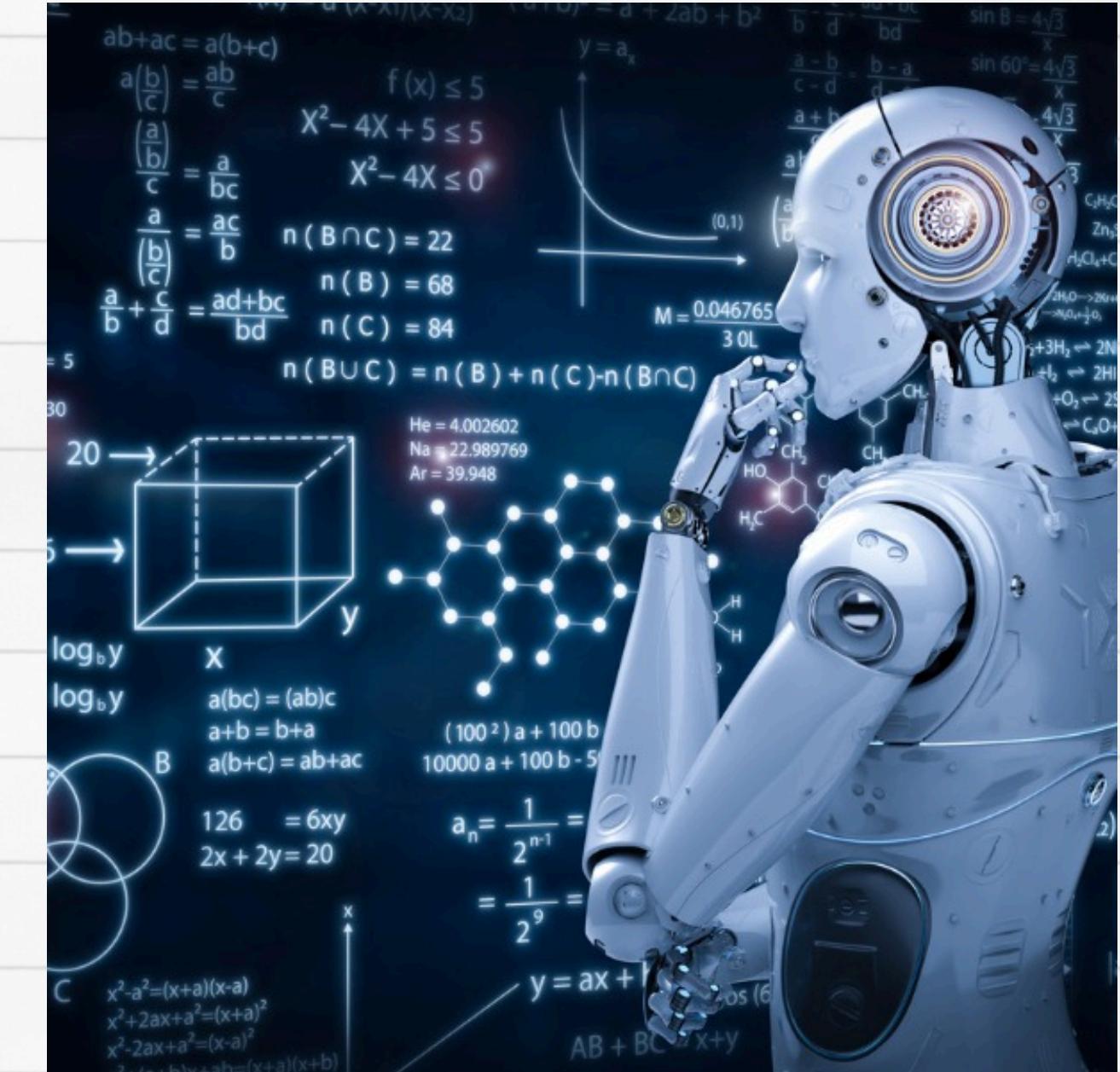
- An intuitive Admin Panel enables administrators to oversee user accounts, with functionalities to delete, block, edit user information, modify default settings, and review user feedback to ensure a secure and efficient user environment.



Machine Learning Algorithms

Why Use Machine Learning?

- Our mobile application relies on machine learning to recognize sign language gestures, translate them into text, and enable two-way communication.
- We selected the following algorithms based on accuracy, real-time performance, and suitability for mobile environments.



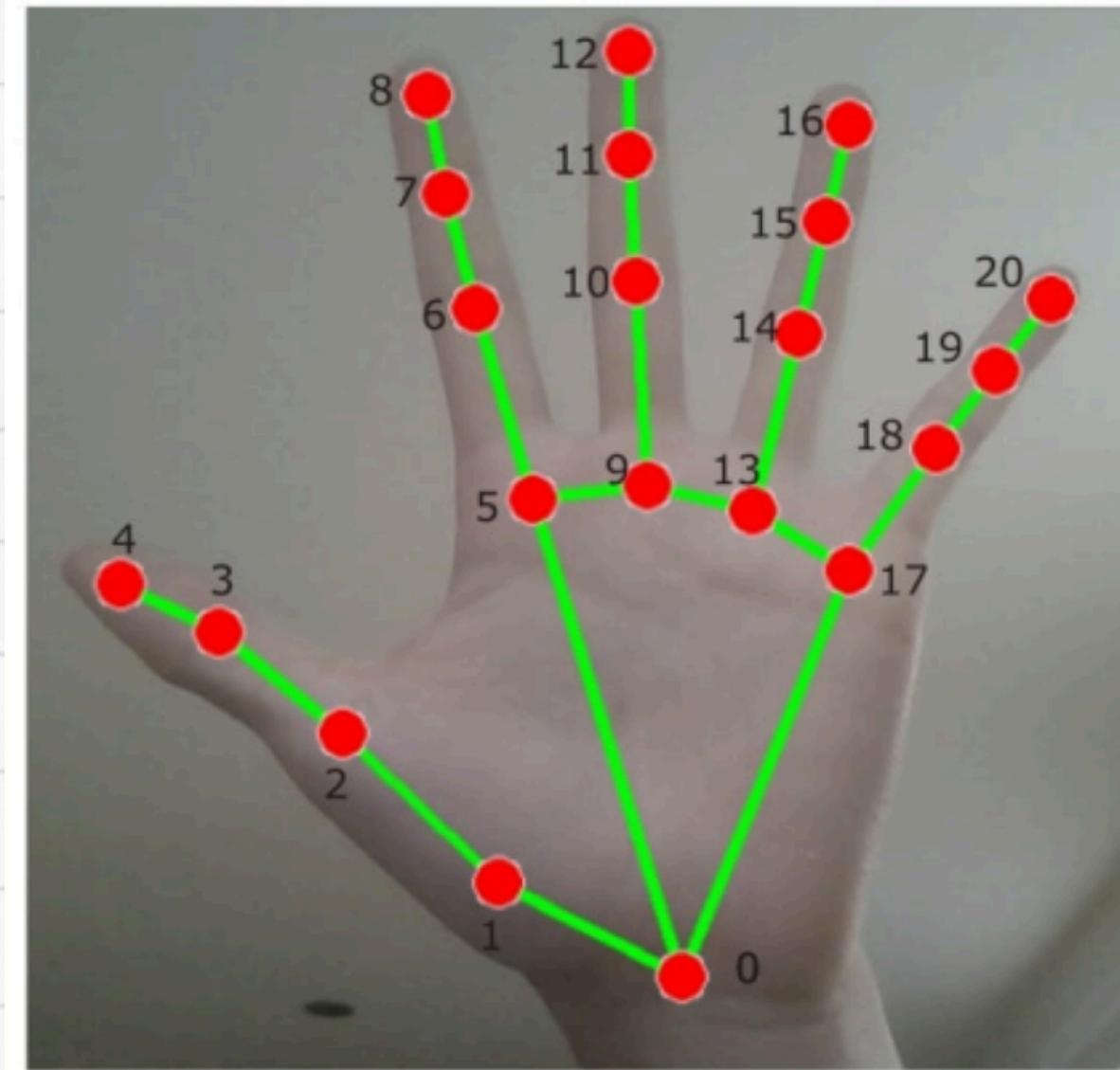
chosen Algorithms

1. MediaPipe Hands (Google AI) – Hand tracking

- **Algorithm Type:** Computer Vision (Deep Learning-Based Hand Landmark Detection)

- **Why?**

1. Detects hand positions and finger movements in real-time.
2. Extracts 21 key points per hand, providing accurate gesture input.
3. Highly optimized for mobile devices (lightweight and fast).



chosen Algorithms

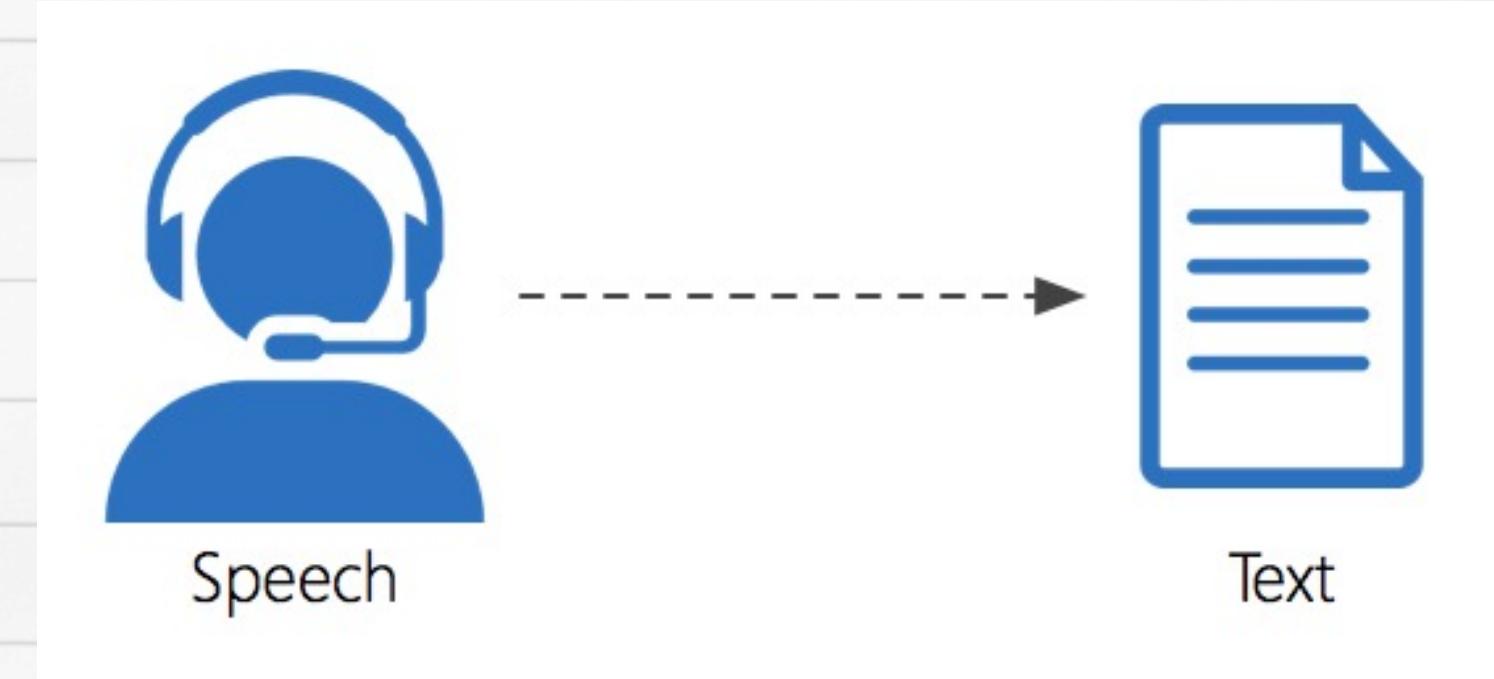
2. SPOTER (transformer Model) – Sign Language Recognition

- **Algorithm Type:** Transformer-Based Deep Learning Model
- **Why?**
 1. Unlike traditional CNNs or RNNs, **Transformers capture complex sign language gestures more effectively.**
 2. Works with sequences of hand movements to detect **full words and phrases** instead of single gestures.
 3. Provides **state-of-the-art accuracy** for real-time sign language translation.

chosen Algorithms

3. Google Speech-to-Text API – Speech Recognition

- **Algorithm Type:** Deep Learning (RNN & Transformers)
- **Why?**
 1. Converts spoken language into text using advanced AI models trained on massive datasets.
 2. Handles various accents, languages, and background noise efficiently.



chosen Algorithms

4. Google Text-to-Speech API – Speech Synthesis

- **Algorithm Type:** Neural Text-to-Speech (TTS) Model

- **Why?**

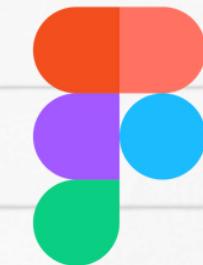
1. Uses WaveNet (Deep Neural Network) to generate natural-sounding speech.

2. Converts text into speech, making communication easier for sign language users.



Tools and technologies

UI/UX Design



Front-End



Back-End



AI & Machine Learning



Database & Storage

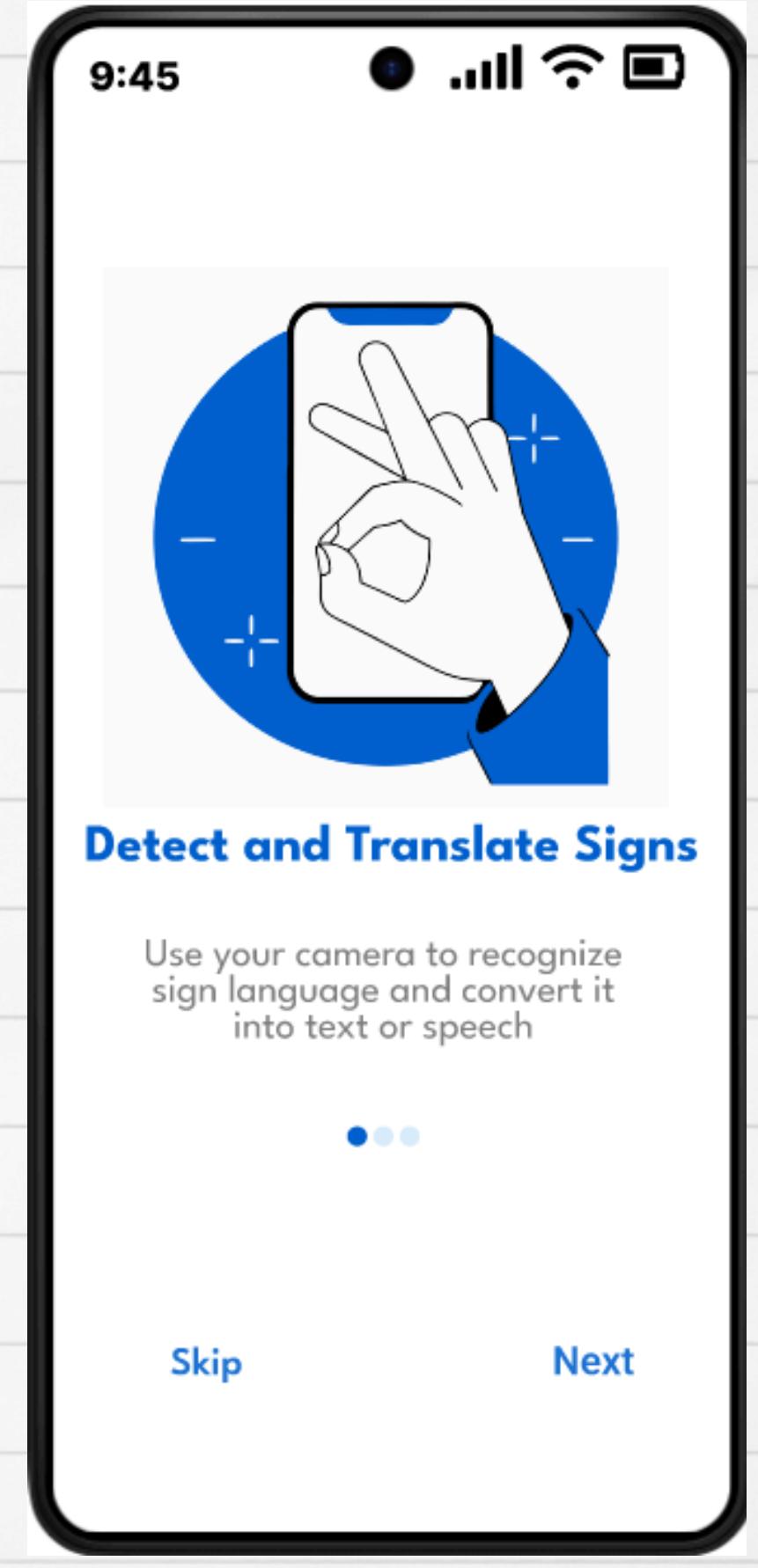
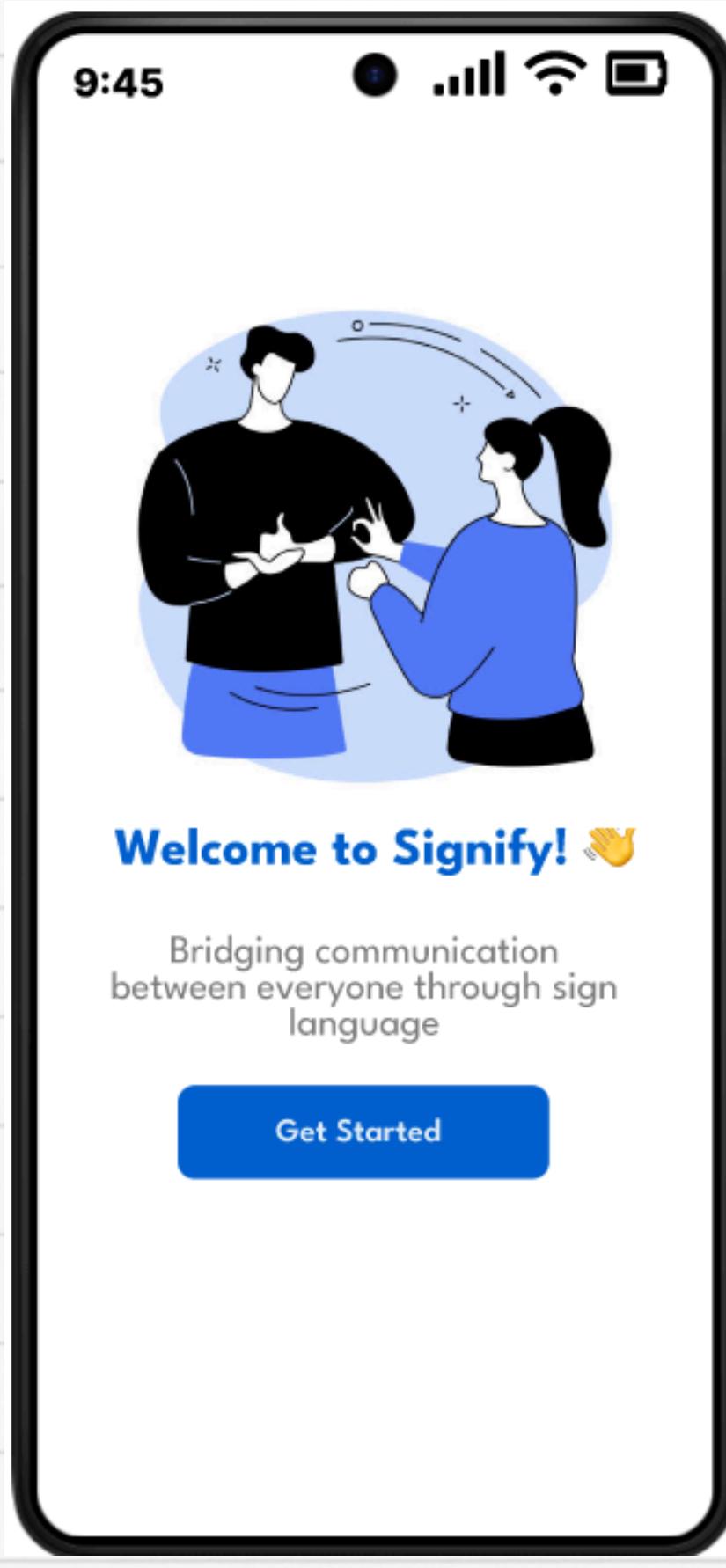
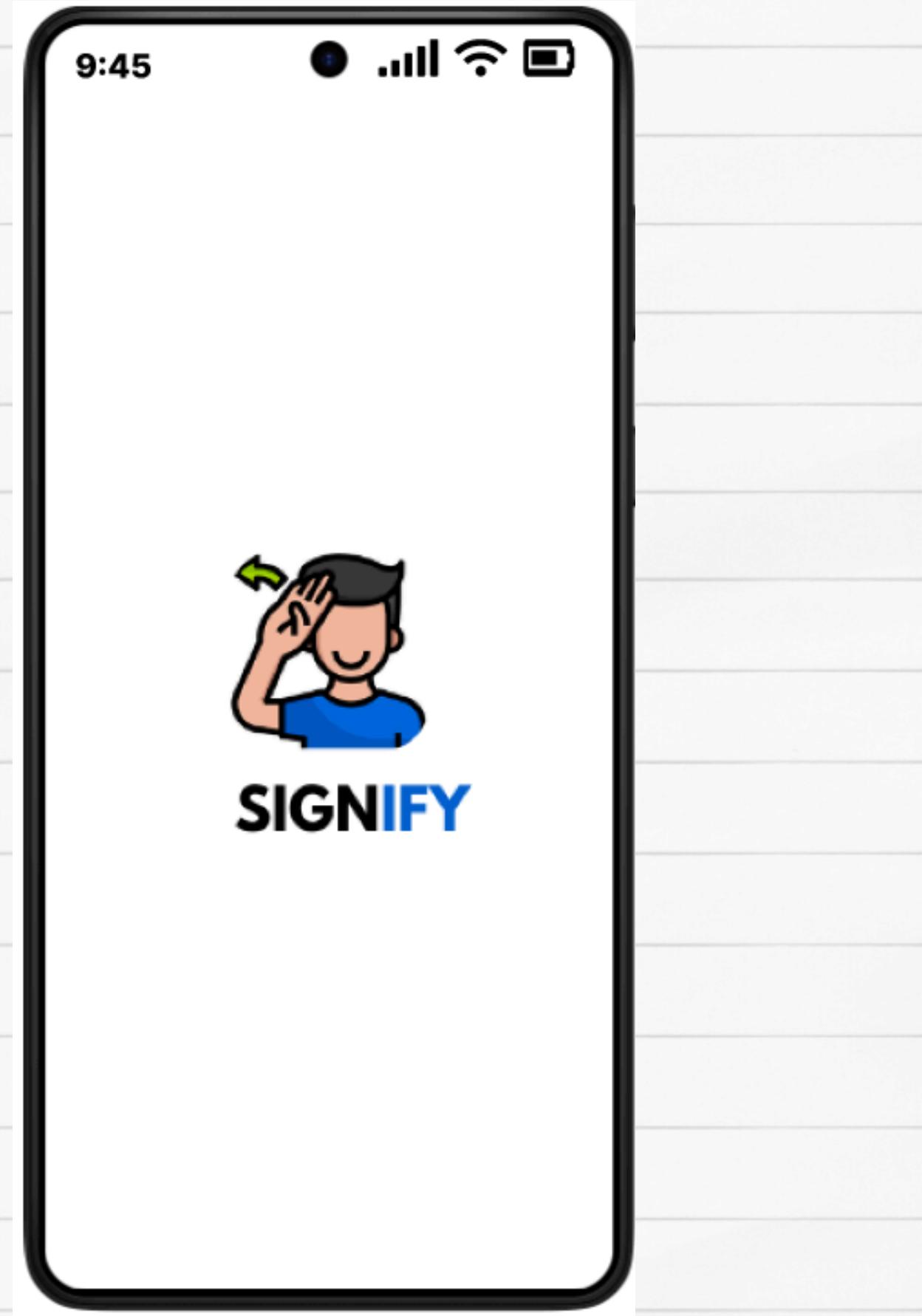


testing



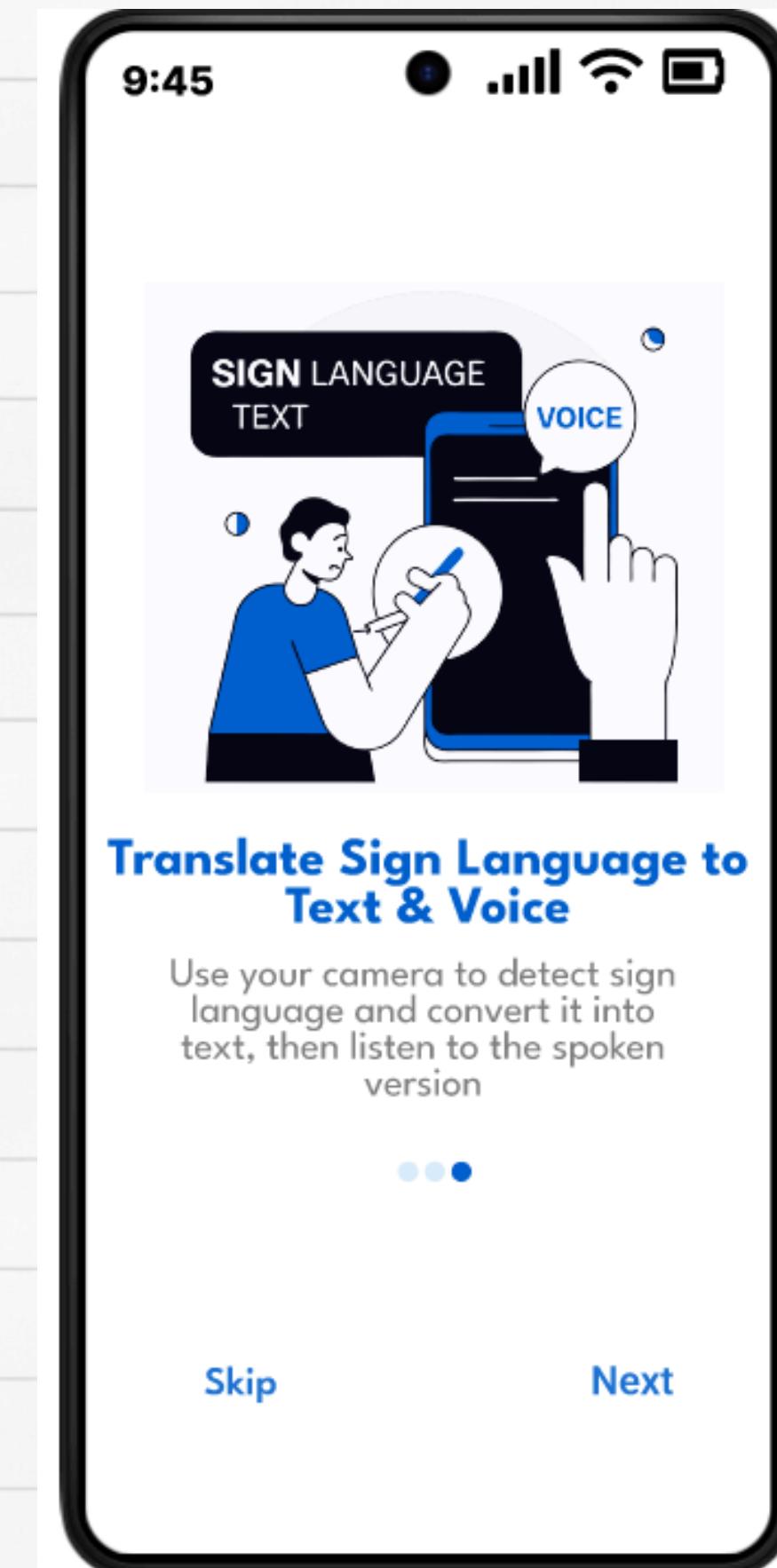
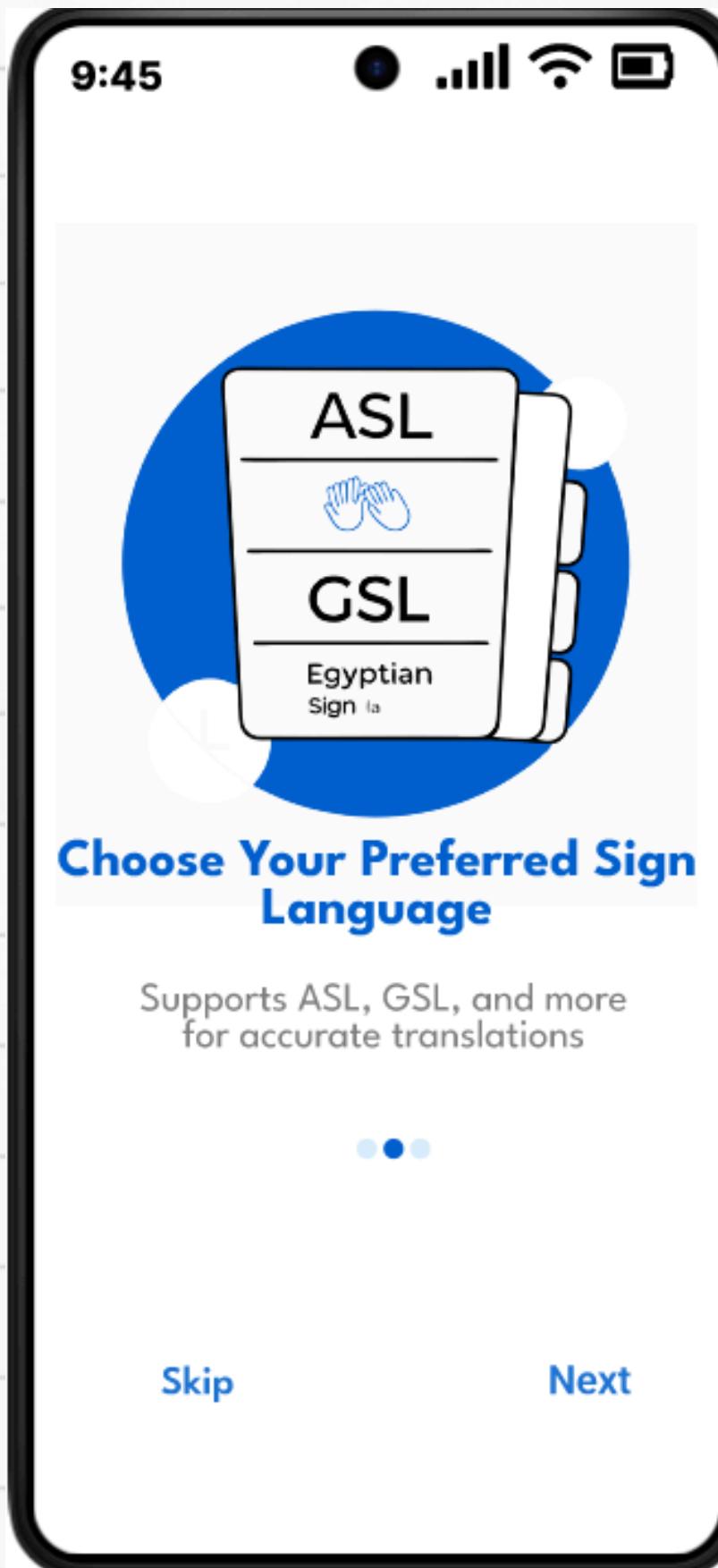
Prototype Screens

Splash & onboarding Screens



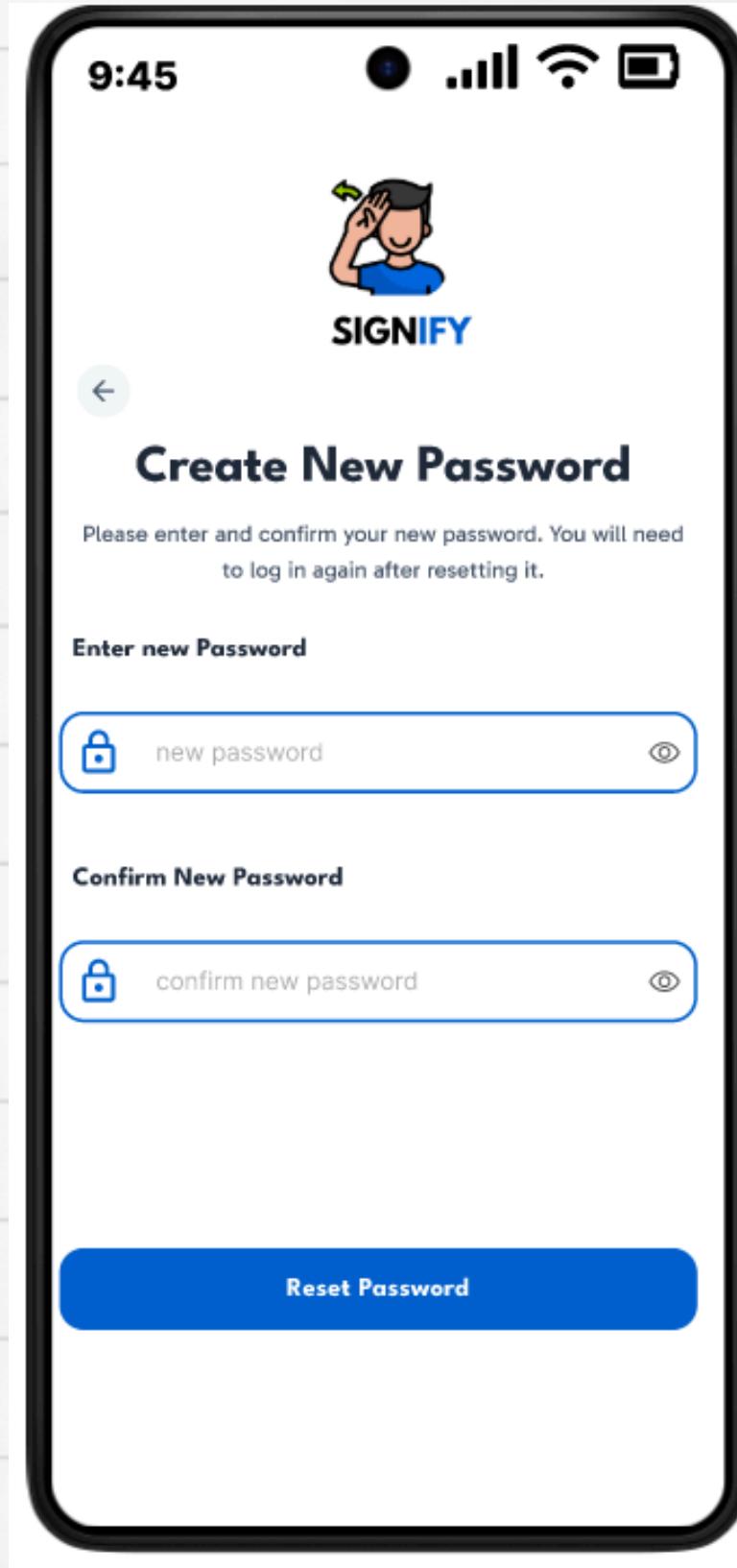
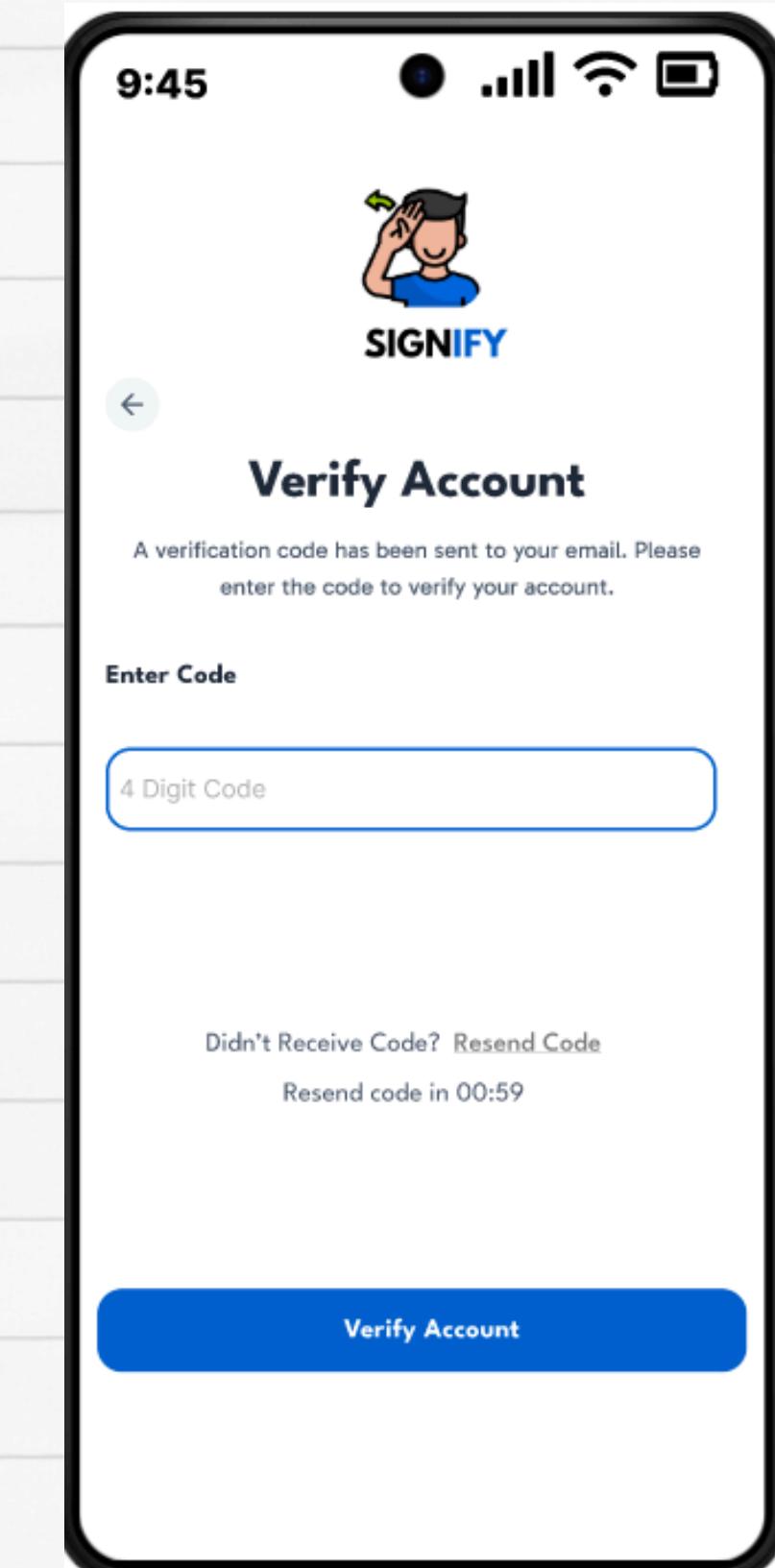
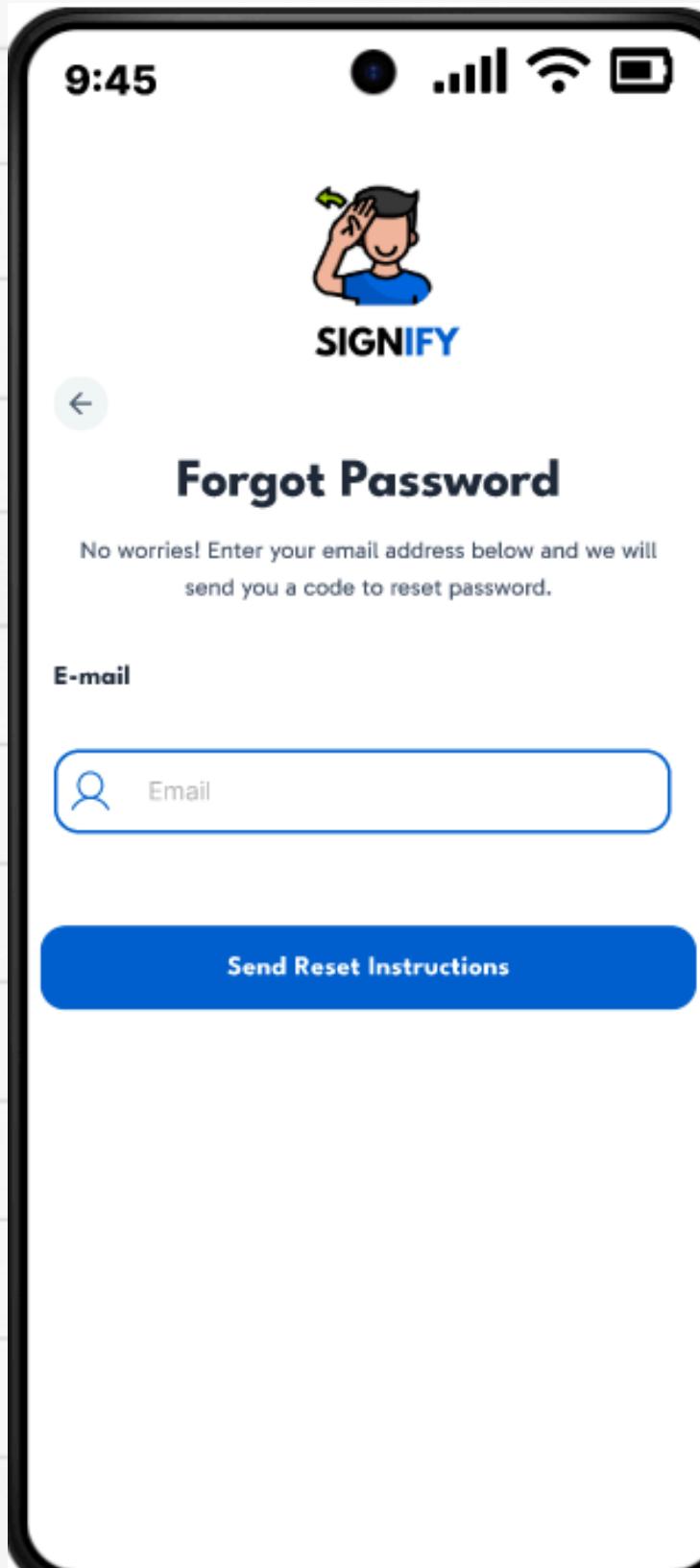
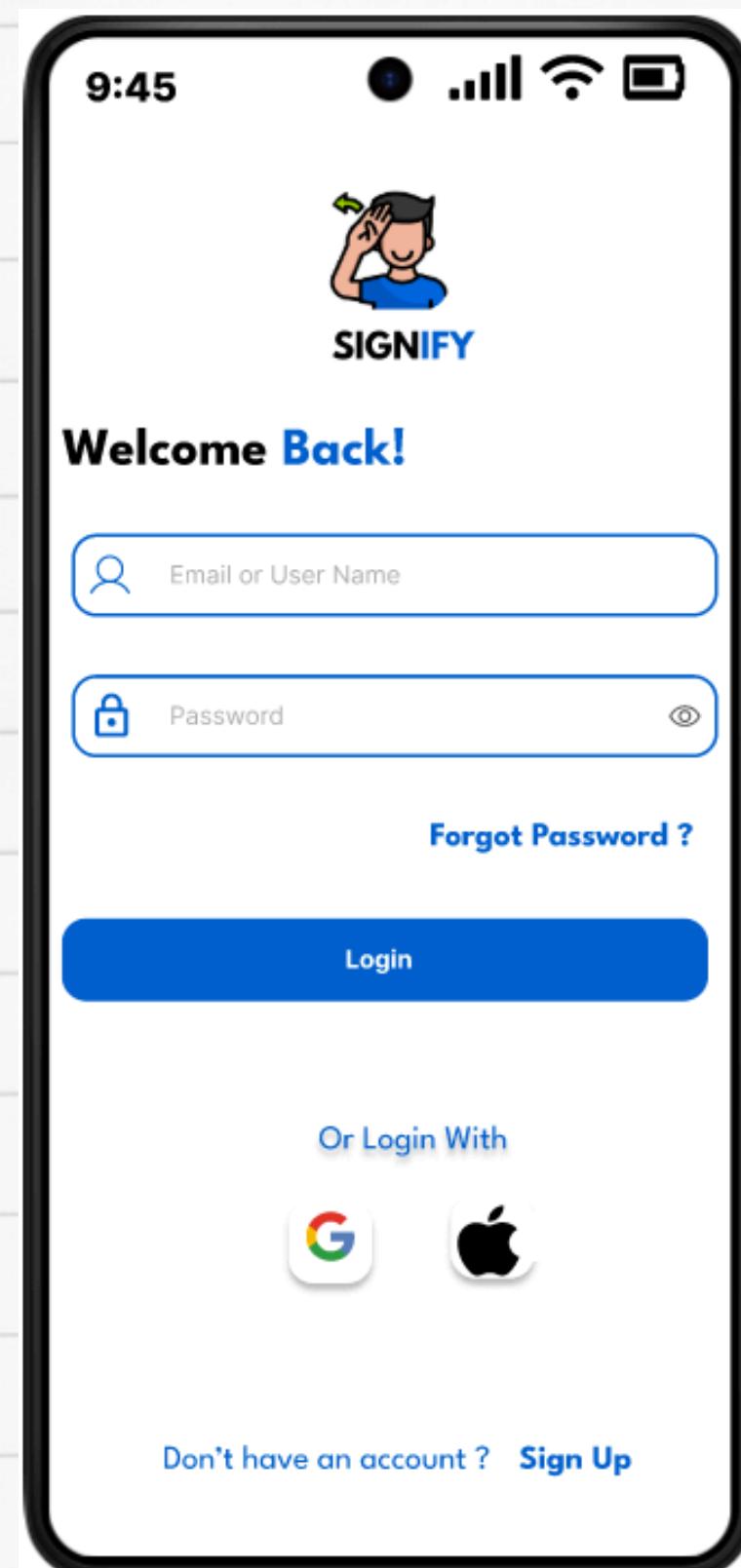
Prototype Screens

Splash & onboarding Screens



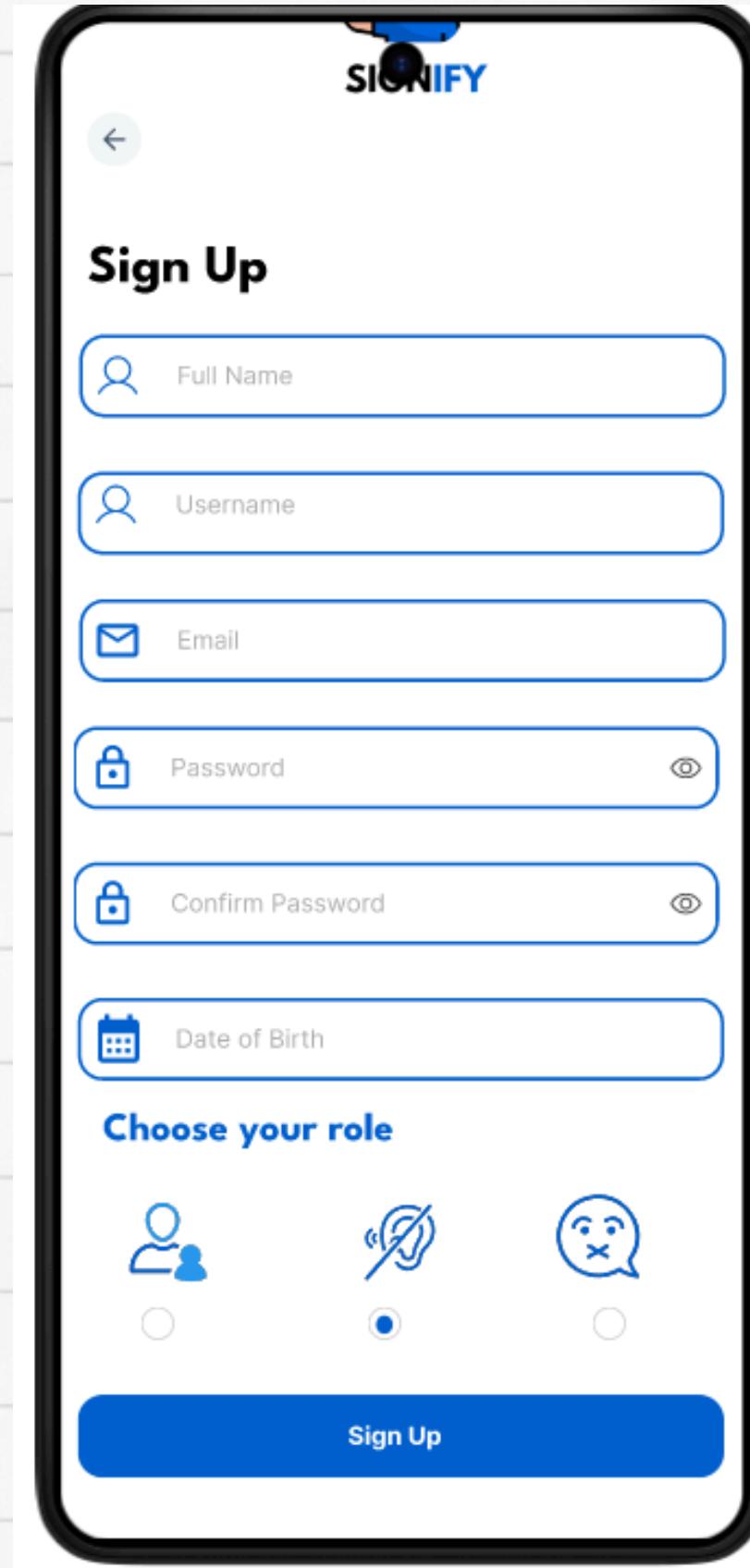
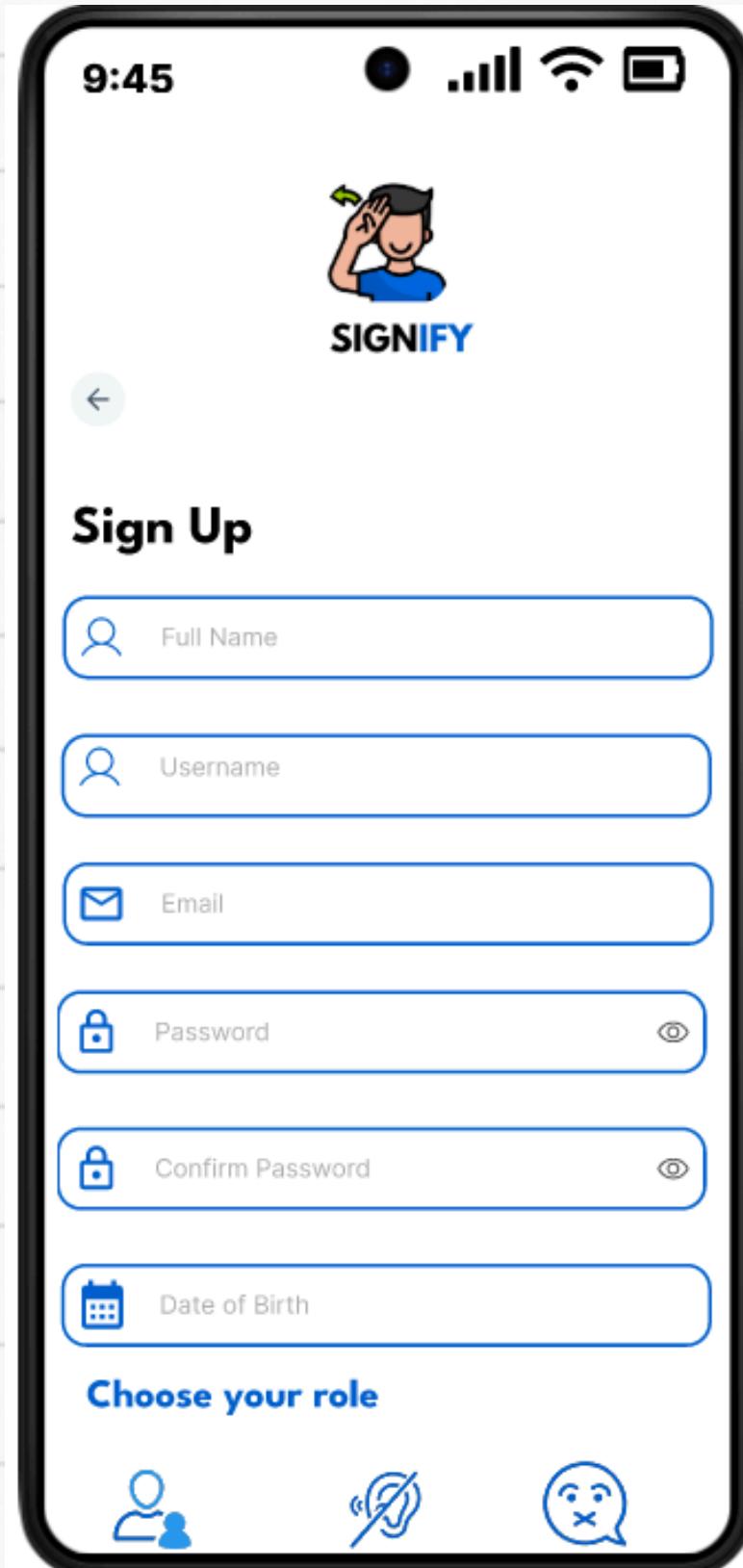
Prototype Screens

login & forgot password Screens



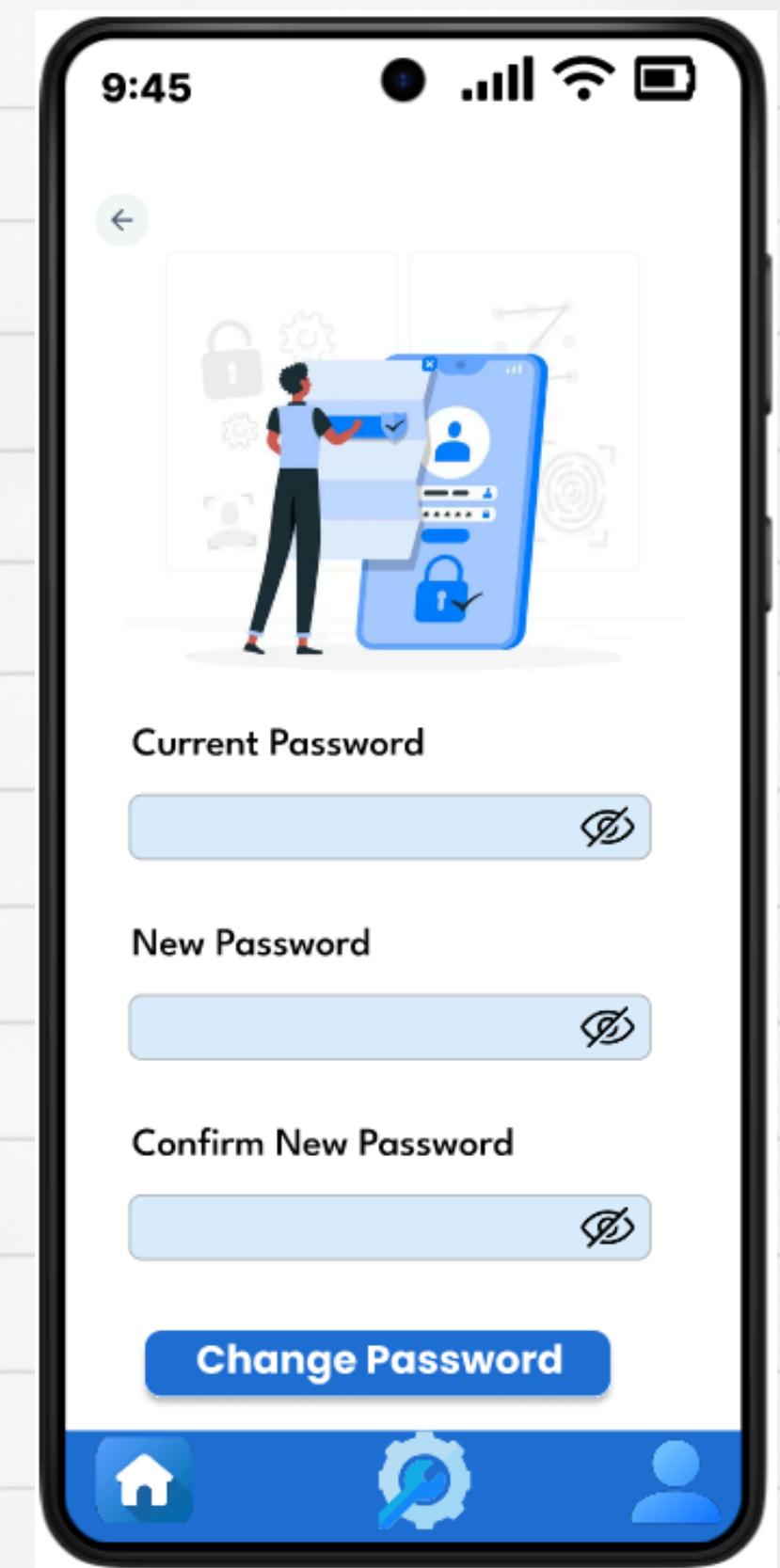
Prototype Screens

Sign up & Home screens



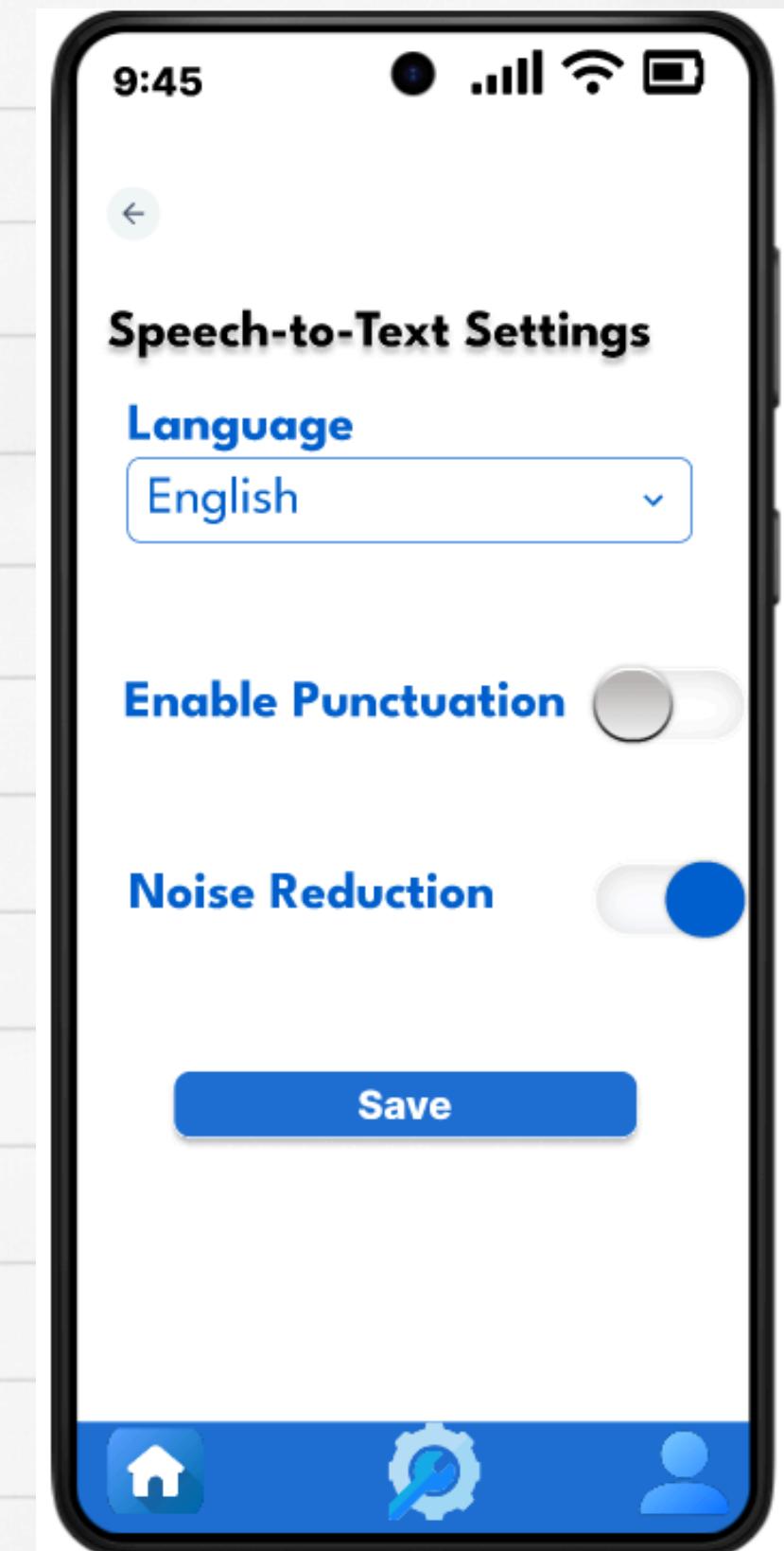
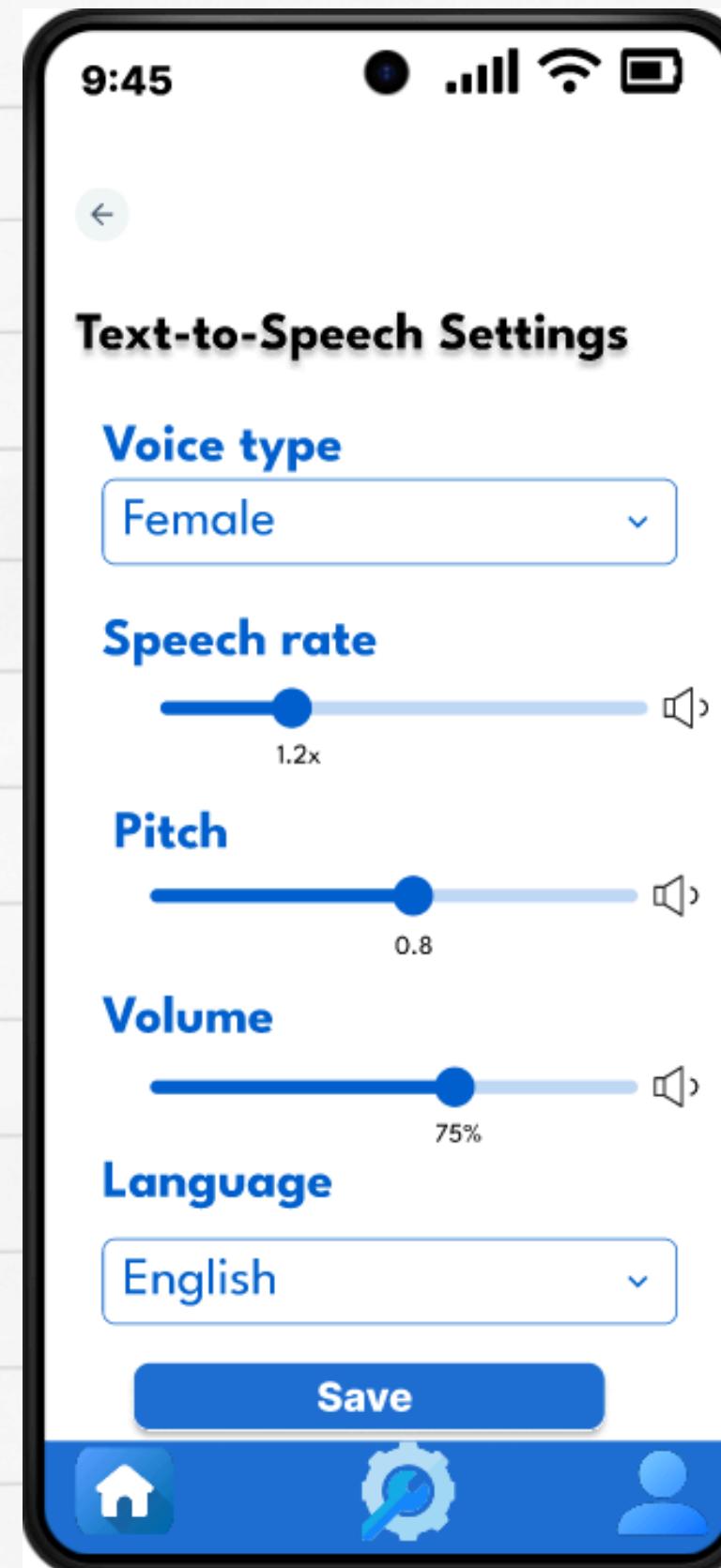
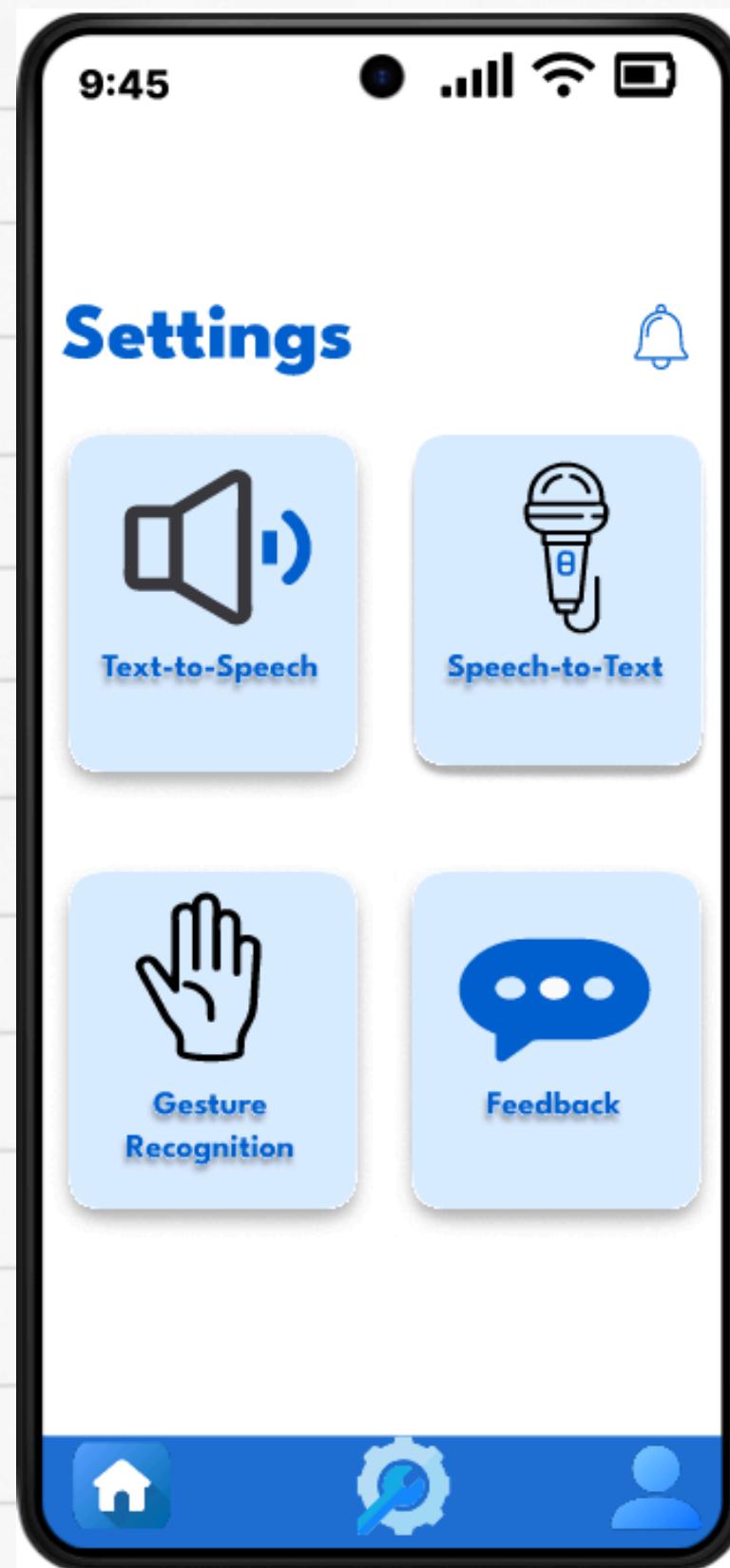
Prototype Screens

View & edit profile screens



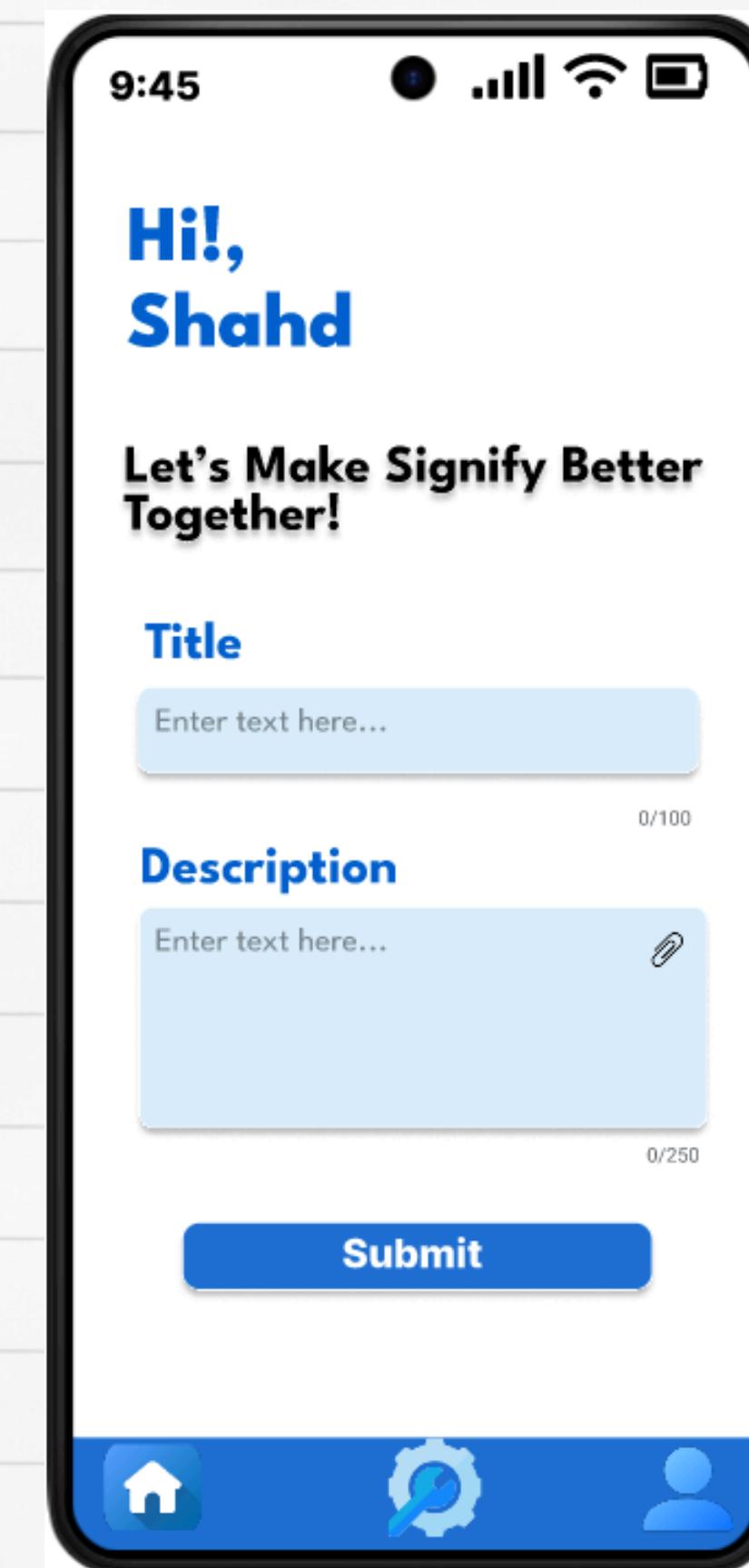
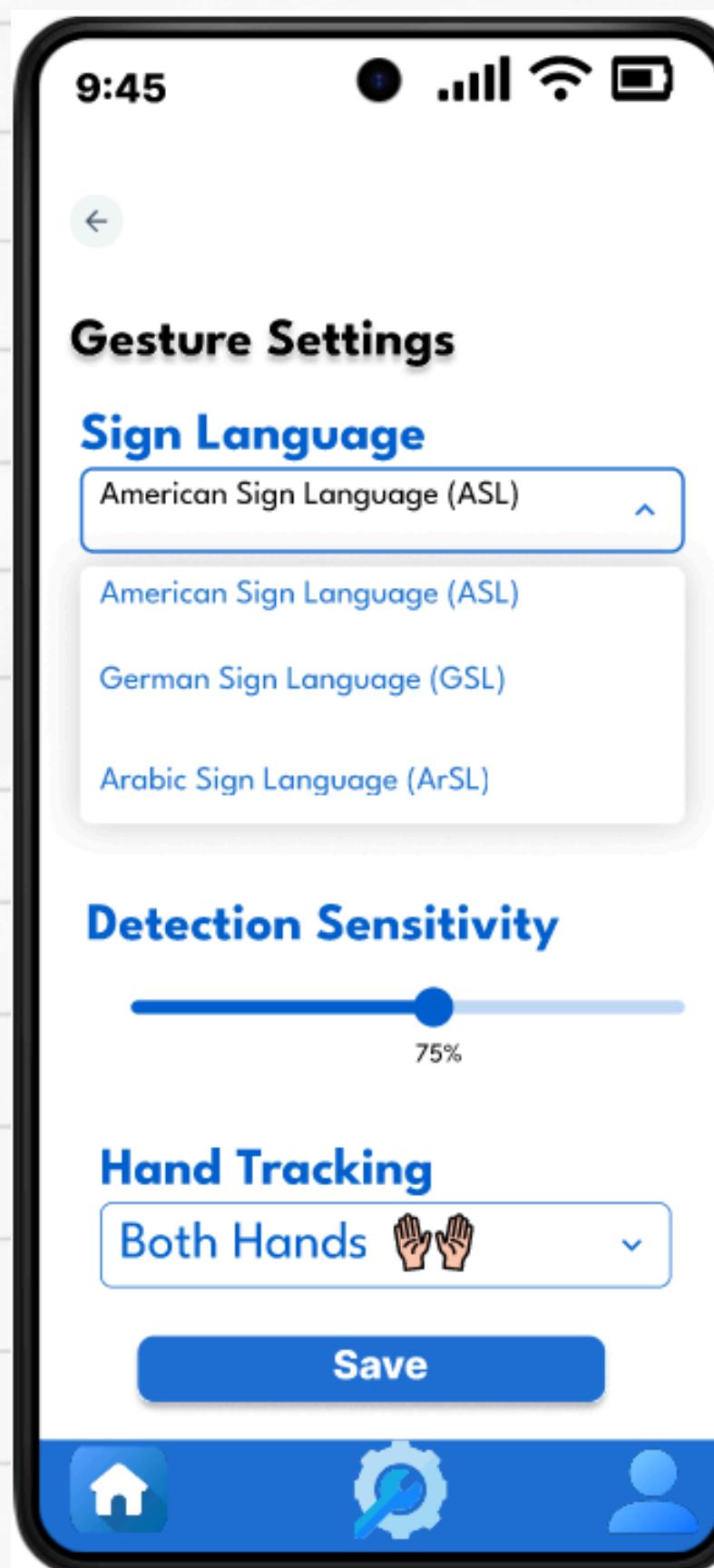
Prototype Screens

Settings screens



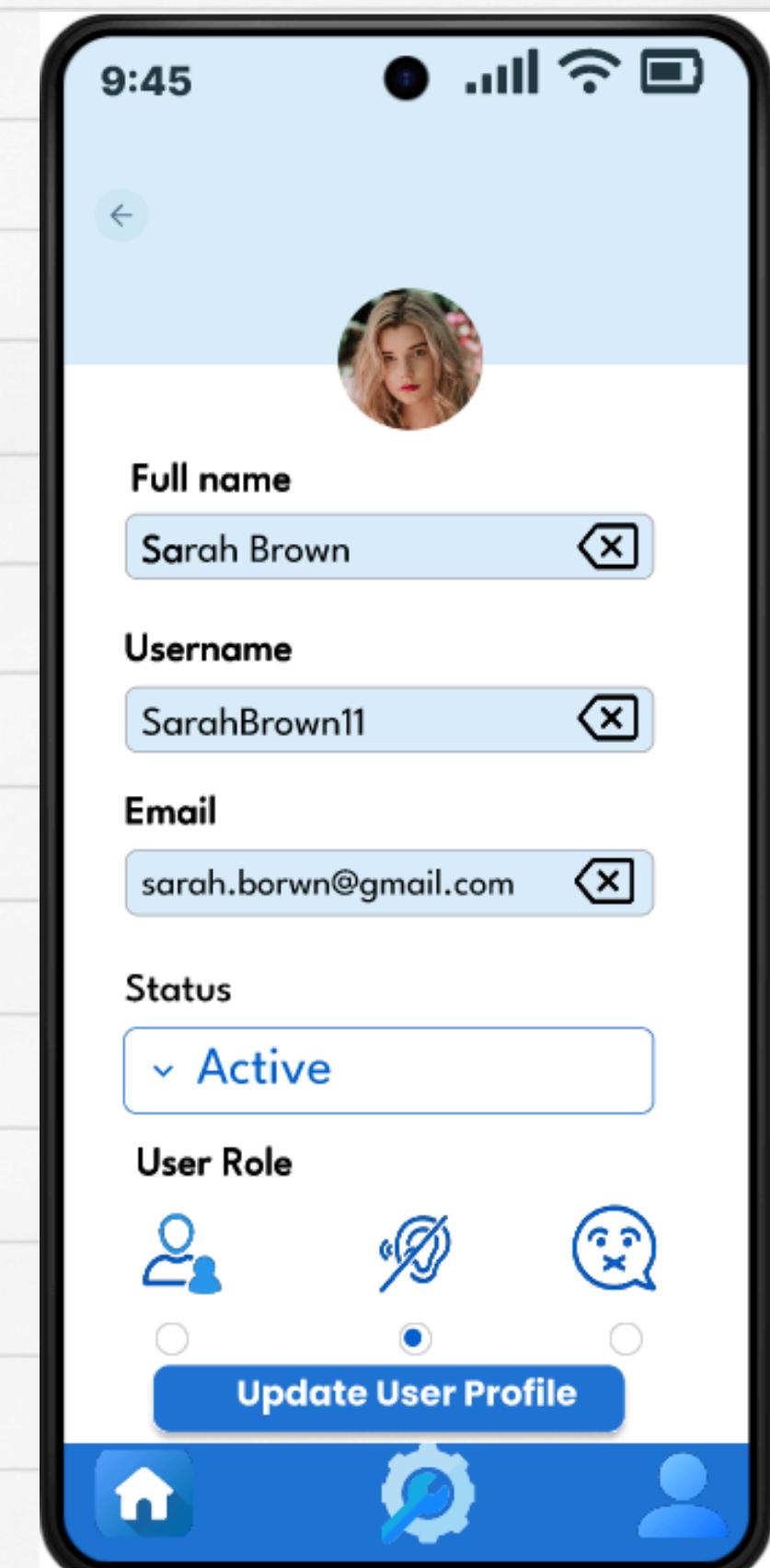
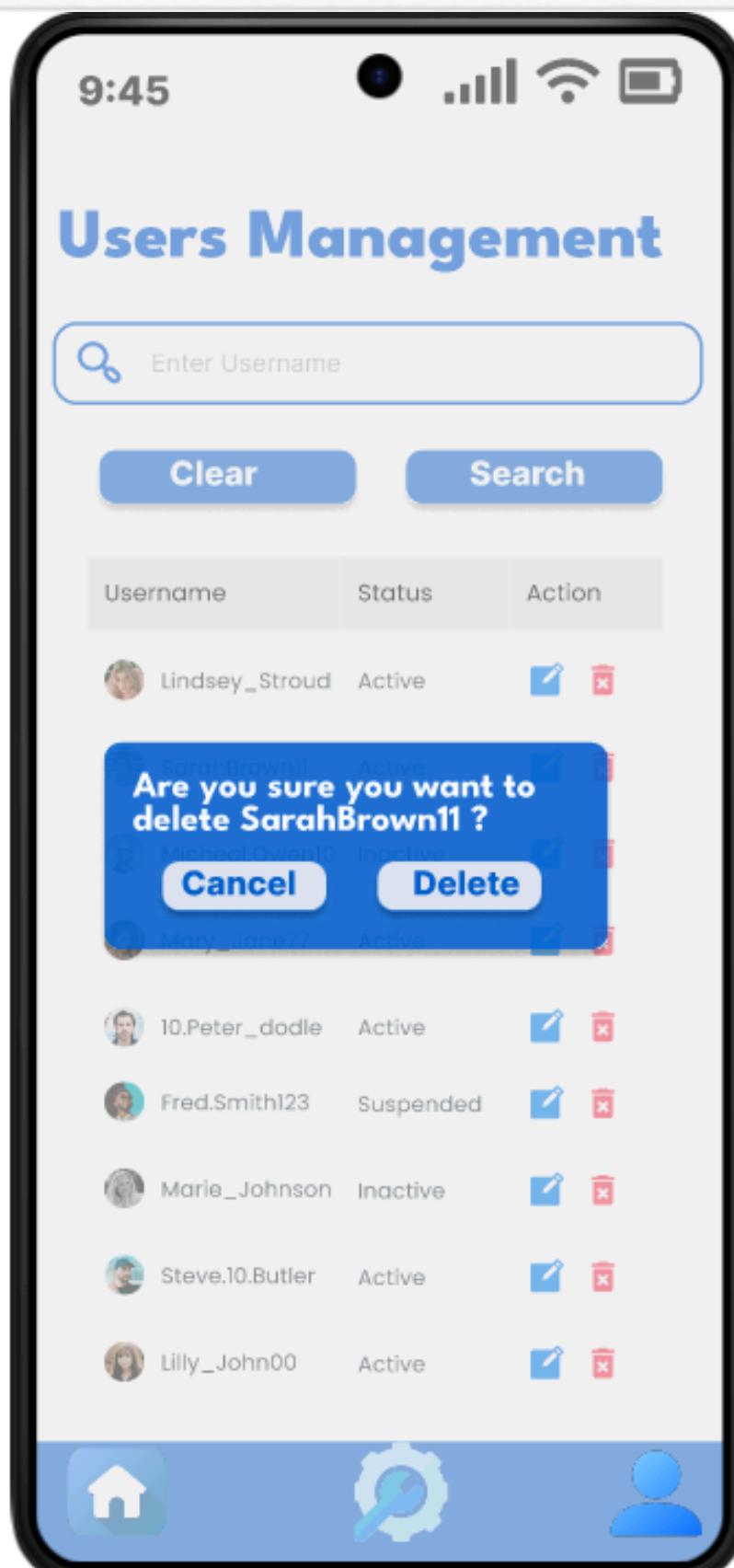
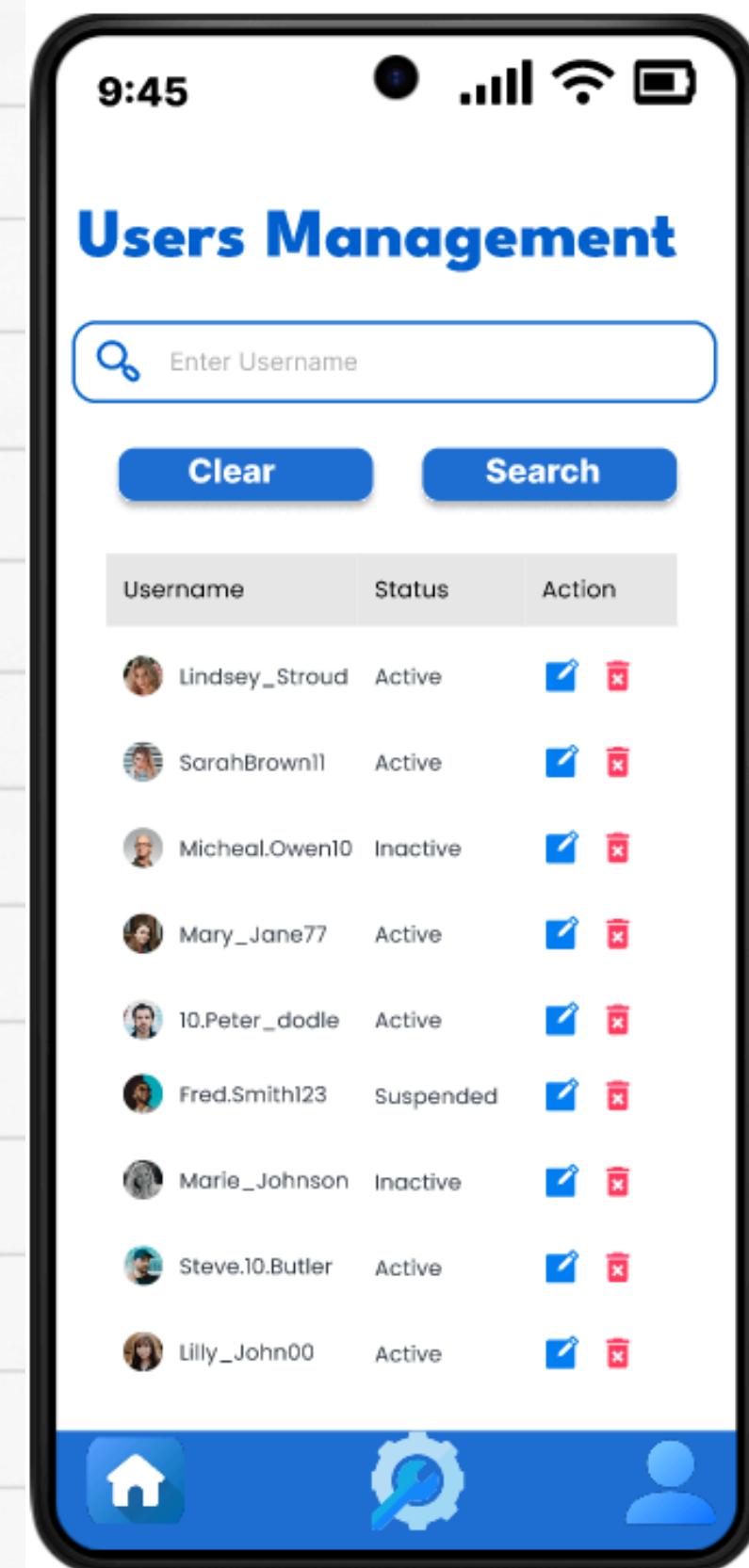
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Settings screens



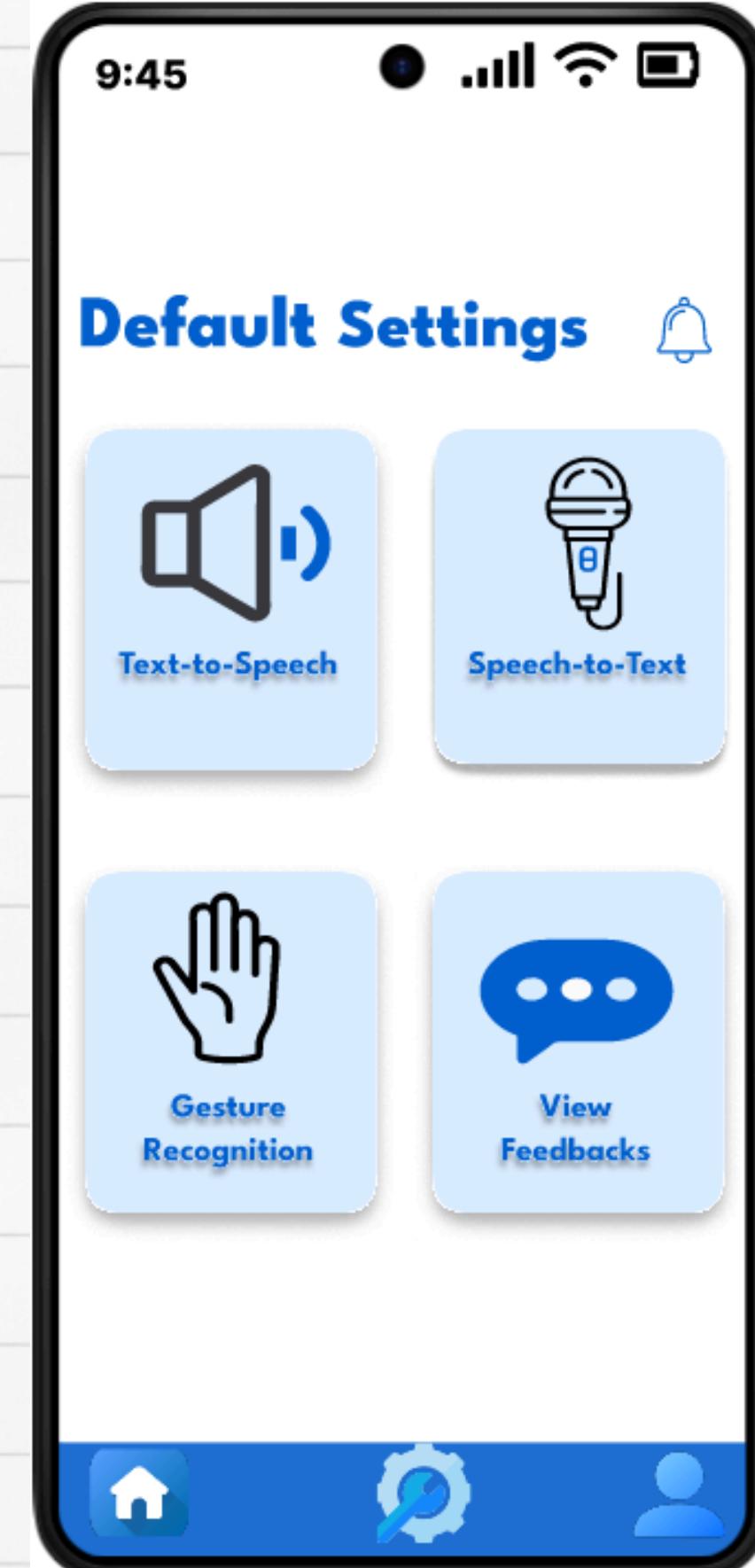
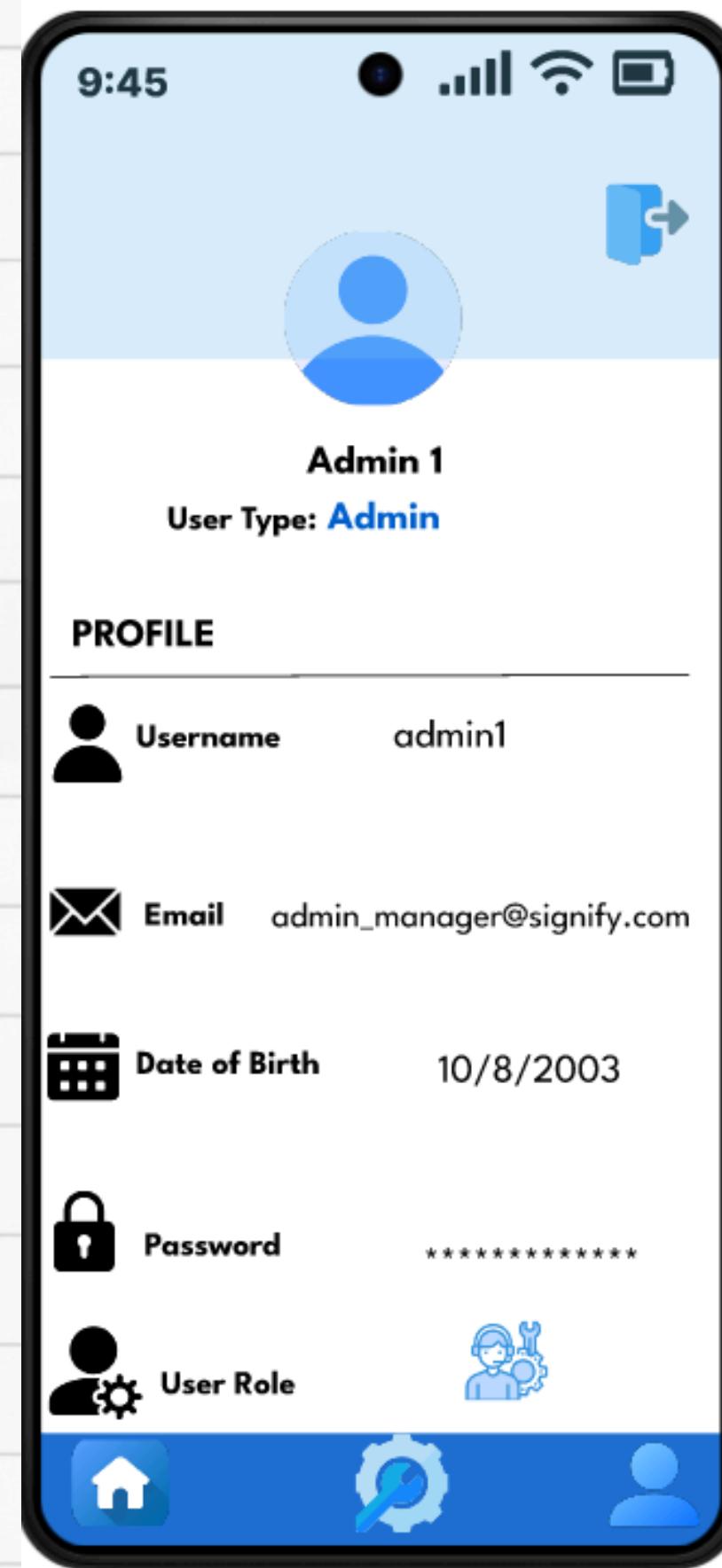
Prototype Screens

Admin screens



Prototype Screens

Admin screens



CONCLUSION

IN CONCLUDING OUR GROUP PROJECT PRESENTATION, WE WOULD LIKE TO EMPHASIZE THAT COLLABORATION AND COMMITMENT ARE THE KEYS TO THE SUCCESS OF THIS PROJECT.

THROUGH THIS TRIP, WE NOT ONLY LEARNED ABOUT THE PROJECT MATERIAL BUT ALSO ABOUT THE TRUE MEANING OF TEAMWORK. WE BELIEVE THAT THE RESULTS WE ACHIEVE REFLECT OUR DEDICATION TO CREATING MEANINGFUL SOLUTIONS.



**thank
you very
much!**

good bye

