

SIGN LANGUAGE COMMUNICATOR



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Introduction

The project I am developing turns American Sign Language (ASL) into readable words

Abstract

The Sign Language Translation App is a mobile application designed to facilitate communication between deaf or hard of hearing individuals and individuals who are unfamiliar with sign languages. The app utilizes including computer vision and machine learning, to recognize and interpret sign language letters, converting them into written words. By bridging the communication gap, the app aims to enhance inclusivity and improve access to information and services for the deaf and hard of hearing community.

Method

1. User Interface:

- Capture Video: The app interfaces with the device's camera to capture live video of sign language gestures.
- Messaging UI: The app provides a user interface for messaging, where users can send and receive messages. The messaging UI allows users to view their conversations, compose new messages, and interact with the messaging features.
- Display Translations: The Sign are displayed to the user as text in a message box in real-time.

2. Sign Language Recognition:

- Video Processing: The captured video frames are processed to extract relevant hand information.

3. Hand-to-text Translation:

- Sign-to-text conversion: The machine learning model convert the recognized symbol to text

4. Integration:

- Backend and Authentication: Firebase was used as the backend infrastructure for storing user information and handling authentication. Firebase provides a range of services, including a real-time database, authentication, and cloud functions, which can be utilized to build scalable and secure applications. With Firebase Authentication, users can sign up, log in, and manage their accounts securely.
- Stream Chat: The Stream Chat package was used to facilitate real-time messaging between users. Stream Chat provides a set of tools and APIs for building chat functionality into applications. It offers features such as creating channels, sending and receiving messages, managing user presence, and handling notifications. By integrating Stream Chat, the sign language translations can be sent to and received by the intended users in real-time, enabling seamless communication between users of the app.

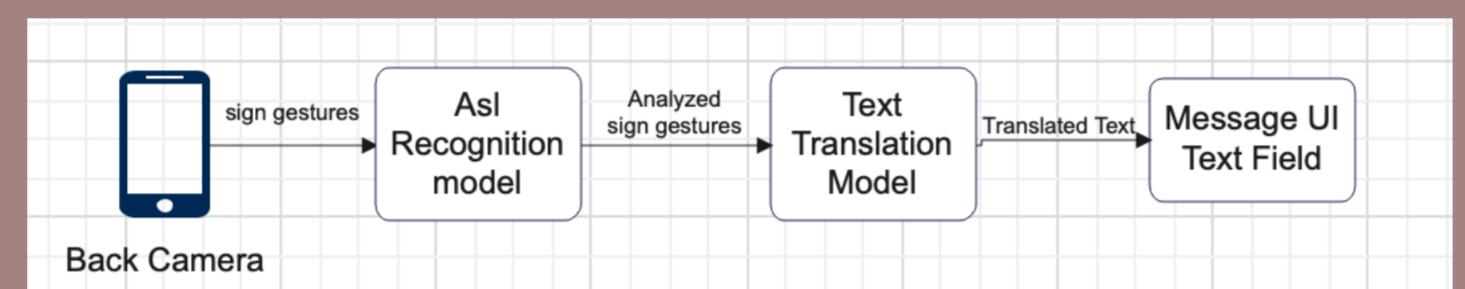
Project brief

The Goal of this project was to develop a system that converts ASL into readable words

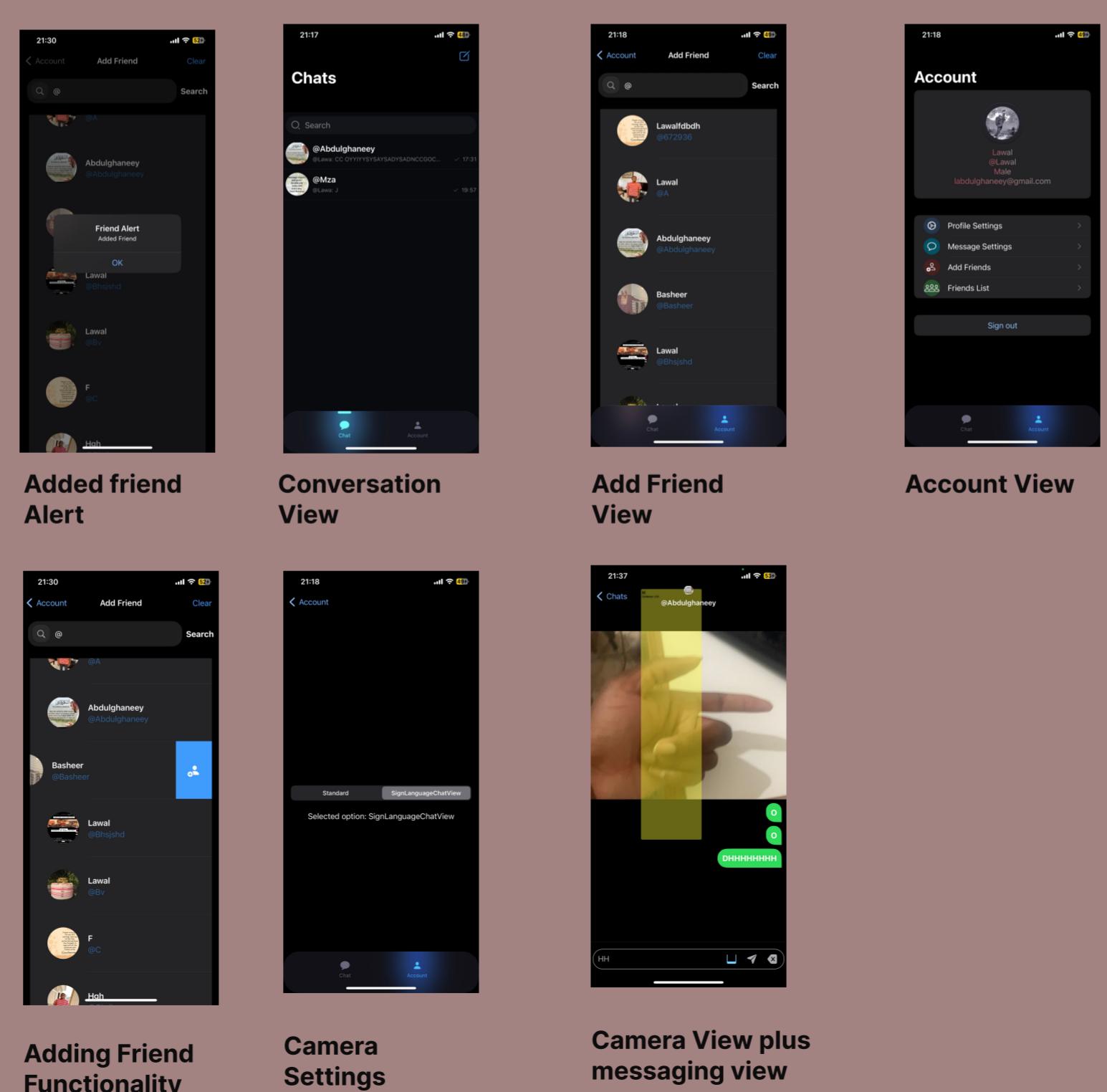
Department

Department of Software Engineering

Module Diagram



Result



Conclusion

During the development of the sign language translation app, several tools and methods were utilized to build different components of the system. Here are some observations regarding the tools and potential areas for expansion:

1. Firebase: Firebase was used for backend storage and user authentication. It provided a reliable and scalable solution for managing user information and authentication. Firebase is known for its ease of use and extensive features, making it a suitable choice for this project.
2. Stream Chat: Stream Chat was integrated into the app for real-time messaging functionality. It facilitated the exchange of translated sign language messages between users. The Stream Chat SDK provided convenient APIs for handling chat features and allowed seamless communication within the app.
3. Camera Integration: The app utilized the device's camera to capture live video of sign language gestures. This feature was crucial for real-time translation. The camera integration allowed users to interact with the app naturally and receive instant translations of their sign language gestures.
4. User Interface: The messaging user interface (UI) played a vital role in displaying the translated sign language messages to users. The UI components, such as message boxes, text displays, and chat bubbles, provided a clear and intuitive way for users to communicate and understand the translated content.

Future Expansions

1. Language Support: The project can be expanded by adding support for multiple sign languages. Currently, the app focuses on American Sign Language (ASL), but incorporating other sign languages would make it more inclusive and accessible to a broader user base.
2. Enhanced Translation Accuracy: Continuous improvements can be made to the translation algorithms to enhance accuracy and reduce errors in converting sign language gestures into text. Integration with machine learning and computer vision techniques can aid in achieving more precise translations.
3. Integration with Sign Language Dictionaries: Integrating sign language dictionaries or resources within the app can provide users with additional references and learning materials. This expansion would facilitate language learning and support users in expanding their sign language vocabulary.
4. Make an android variant of the app.