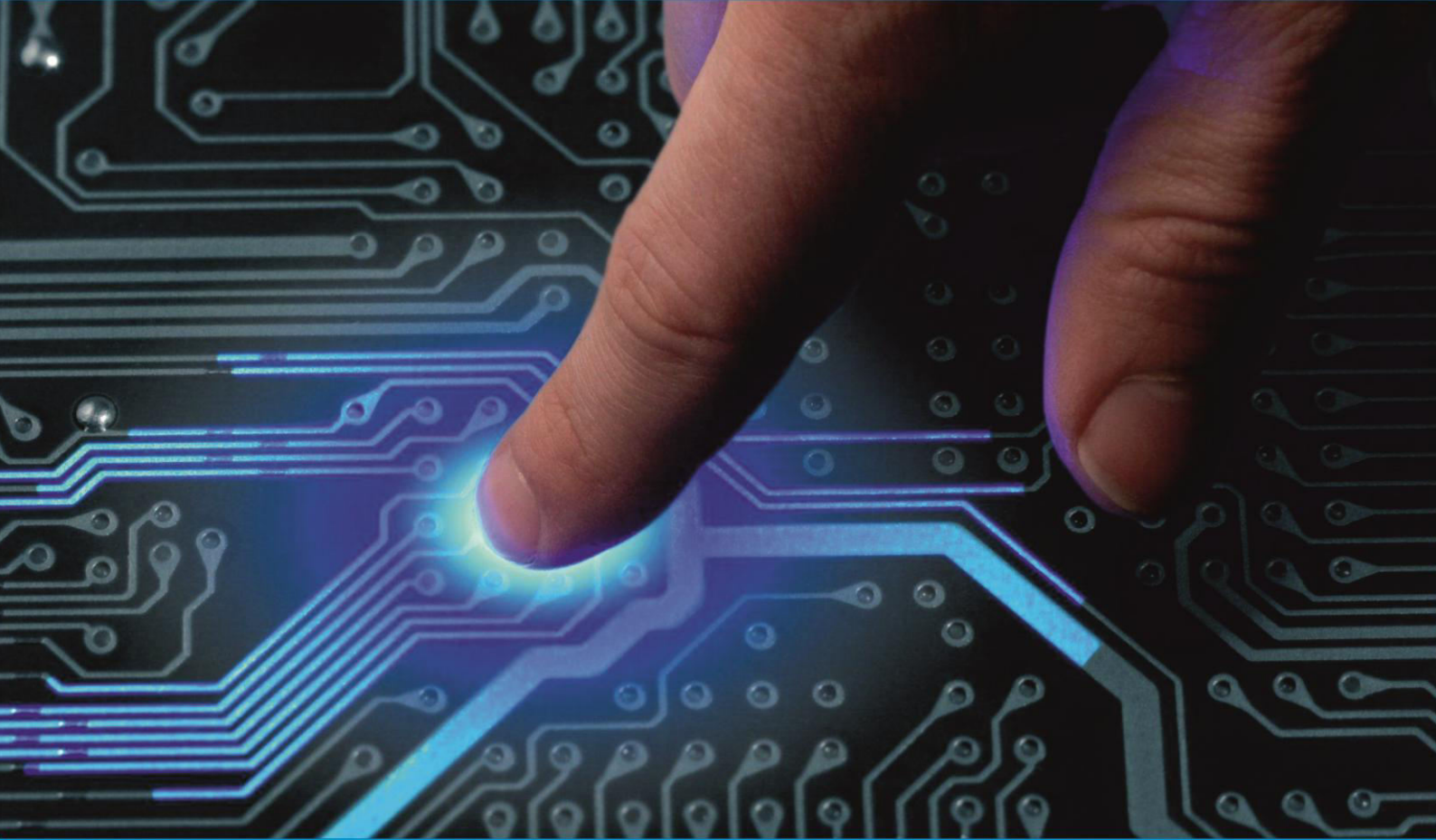




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Speech to Sign Language Translation

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ABSTRACT: Sign Language communication is the only viable and effective method of communication for deaf people or people with hearing loss. Without it, they cannot communicate and express themselves to others in the world. There is a need for developing useful tools using technology to help and enable people with disabilities to be given every opportunity a normal person gets in real-world scenarios to progress in their life. We hope to provide such tool for improving their lives. Counterintuitively, this tool can also be used to educate people about Sign Language and help them communicate with people with disabilities. By giving Speech input, the tool will display the corresponding Sign Language gestures, thus enabling translation. This project hopes to close the gap between these groups of people and unite them.

KEYWORDS: ISL, interpretation, communication, gestures, Deaf Human, Sign Language Translation Systems, Automatic Speech Recognition.

I. INTRODUCTION

Deaf and hard-of-hearing people use Indian Sign Language to communicate by making gestures with various parts of their bodies. There are various groups of deaf people all over the world, and their languages will be different as well. American Sign Language (ASL) is the sign language used in the United States.; In the United Kingdom, British Sign Language (BSL) is used, and in India, Indian Sign Language (ISL) is used to share thoughts and communicate with one another. Unlike acoustically transmitted sound patterns, sign language relies on body language and manual communication to express the thoughts of people. It is done by integrating hand forms, hand orientation and movement, and facial expressions all at the same time. It can be used by people who have difficulty listening, people who can hear but cannot talk, and regular people to communicate with people who are deaf. Manual communication and body language (non-manual communication) are used to express emotions, ideas, and feelings in "Indian Sign Language (ISL)." Signs in ISL can be divided into three categories: One-handed, two-handed, and non-manual signs are all available. One-handed and two-handed signs are also known as manual signs because the signer makes the signs with his or her hands to convey details. Changes in body posture and facial expressions produce non-manual signals. This tool converts English speech into text and displays the corresponding Sign language, allowing hearing impaired people in India to communicate with others.

II. METHODOLOGY

This application begins by translating spoken words and sentences (input audio signals) into text using speech to text Flutter package. A library that provides access to device-specific speech recognition. The speech to text process is completely on-device and hence it provides no constraints regarding internet availability and privacy issues. This plugin includes a series of classes that make it simple to use the underlying platform's speech recognition capabilities in Flutter. As Flutter supports Android, iOS and the Web, it is truly a multiplatform application.

The tool is built using Flutter SDK. Flutter is a new application development interface which is multiplatform and highly scalable. The deployment of multiplatform codebases is illustrated by Figure 1.1. This speech to Indian sign language app makes communication easier for users. Since Flutter platform is used to build this app, it can be simultaneously developed for both Android and iOS platforms, thus increasing the target user base.

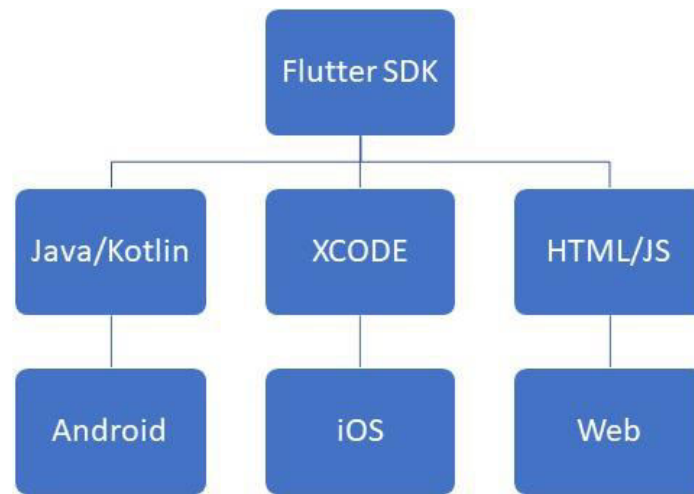


Fig 1.1 Flutter SDK Structure

The working of the tool is illustrated in the following flow charts.

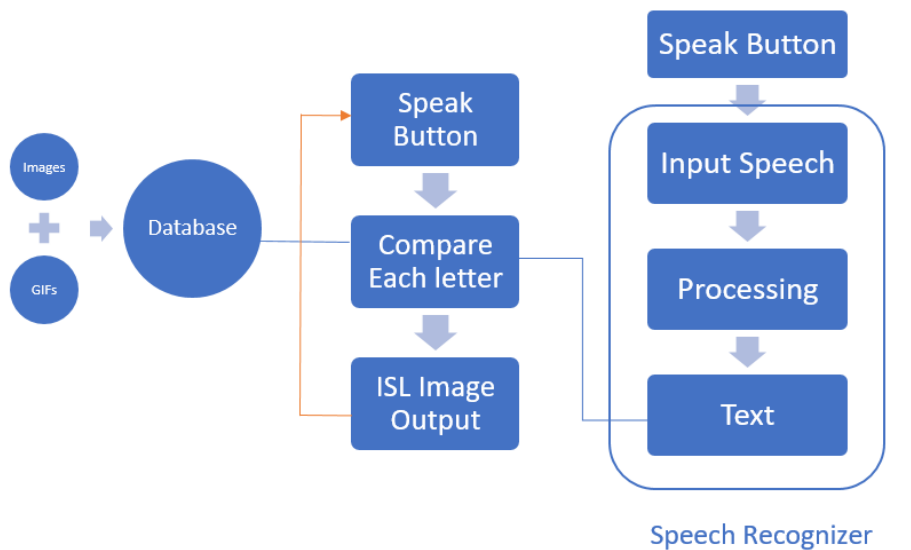


Fig 1.2 Project Workflow

III.APPLICATION INTERFACE

Most commands phrases and words used in communication are indexed and their corresponding gestures are specifically stored in a list for efficient translation and time saving. The rest of the text is broken down are individually translated letter-by-letter for greater user understanding and learning. The converted text is then split into individual letters for which the corresponding ISL signs are displayed (Figures 2.1, 2.2 and 2.3).

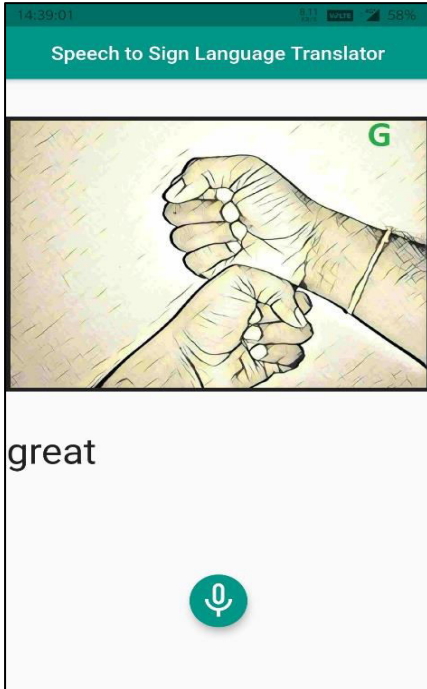


Fig 2.1 Letter

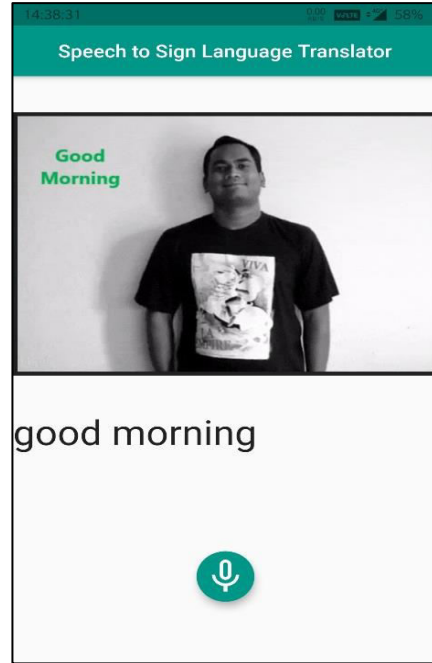


Fig 2.2 Sentence GIF

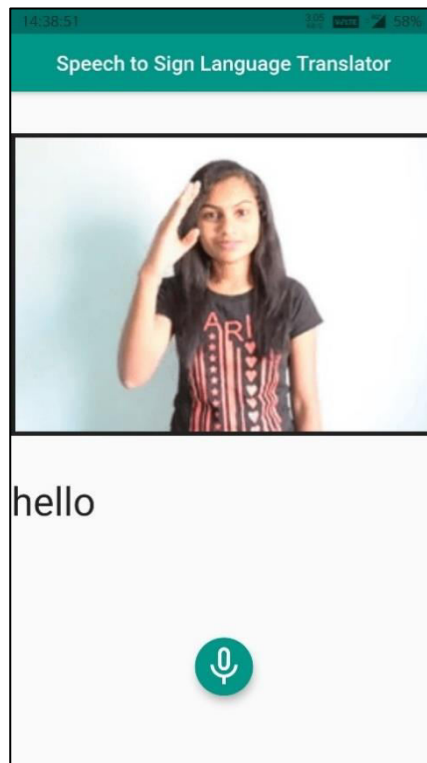


Fig 2.3 Single word GIF



IV. CONCLUSION

Sign Language translation is an area with huge potential and all work done for improving it will definitely help and empower people with disabilities and our world will become more inclusive. We hope our tool and research will have a positive impact on society and bridge the gap between people in terms of communication and expression of thoughts and ideas and also educate and spread awareness among the general population.

V. FUTURE SCOPE

1. New languages can be implemented apart from English for Speech to Text translation which would increase the user base and help this tool reach new audiences.
2. Additional GIFs can be added to serve new words and phrases which would aid faster communication and increased efficiency.
3. Live, Real-time translation can be developed which will translate words and sentences on the fly and help in real world back and forth communication.

VI. ACKNOWLEDGEMENT

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