IYAL : REAL-TIME VOICE TO TEXT COMMUNICATION FOR THE DEAF

Subiksha K
subisubhiksha028@gmail.com
Swathi D
swathi752005@gmail.com,
Vennila V
vvennila610@gmail.com,
Vishnu Bharathi J
bharathijvishnu@gmail.com,
Pre-final year, Department of Electronics and Communication Engineering, M Kumarasamy College of Engineering

Mrs T Balamani, Assistant Professor, Department of Electronics and Communication Engineering, M Kumarasamy College of Engineering
balamanit.ece@mkce.ac.in

Abstract:

The Iyal app is a real-time communication tool designed to assist those who are hard of hearing or deaf in daily situations, much like the Nagish app. Through speech-to-text translation and vice versa, Iyal ensures seamless communication in both personal and professional contexts. Because the software is bilingual, users may communicate with ease regardless of the language being spoken. Its advanced AI speech recognition and text-to-speech algorithms produce accurate translations in real time. Reversible font sizes and background colors are among the adjustable accessibility options that Iyal provides to further meet various needs. This user-friendly program can assist the deaf population become more connected and autonomous, which will increase social engagement and facilitate conversations.

Keywords:

Speech recognition, Multilingual, Social Interaction

1.INTRODUCTION

Phone communication has always presented a big obstacle for people who are deaf or hard of hearing. Voice discussions give convenience and immediacy that text messaging and other textual modes of communication cannot match. This situation has changed with the introduction of real-time voice-to-text phone call apps, such as the well-known Nagish app, which enable the deaf population to converse via phone calls without the need for an intermediary or translator. These applications provide a new degree of autonomy by allowing users to communicate text-based and use speech recognition technology to seamlessly engage with hearing people.

Making a brief phone call is often the most effective way to communicate. However, phone calls have historically presented a major obstacle for the hard of hearing and deaf. It may be tough to comprehend the conversation if you cannot hear the other person's voice. Relay services, or video conferences using sign language and an interpreter from a third party translating spoken words, can be helpful but have drawbacks of their own, including slow translation times, privacy issues, and the requirement that both participants know sign language.

Voice-to-text phone call apps can be useful in this situation. Through the use of real-time text translation, these apps enable deaf people to take part in phone conversations without the assistance of an interpretation. This gives them greater freedom and provides a quicker, more private, more flexible means of communication.

Real-time communication is one of the main benefits of voice-to-text phone call applications. These applications provide instantaneous, back-and-forth interactions, much like a typical phone call, in contrast to texting, which sometimes involves delays. This is especially helpful when answering customer service concerns, making arrangements, or setting up appointments—all tasks that require quick thinking and urgency.

Many deaf people have historically made phone calls using relay systems. These services, however, call for the involvement of a third party, which may cause privacy issues. Many people find it awkward to have someone else join them in conversation, whether they are talking about delicate subjects or they just want to engage in more intimate chat. Voice-to-text applications eliminate this barrier, enabling users to converse freely and in more private. Apps for text-to-voice are designed with accessibility in mind. They have straightforward user interfaces that put ease and clarity first in order to make them easy to use. Many programs, such as Nagish, let users change text displays, colors, and font sizes, which makes it simpler for those with extra visual impairments to participate in conversations comfortably.

Given the diversity of the deaf community worldwide, many voice-to-text applications support many languages. This makes it possible for people with various linguistic backgrounds to converse successfully. The program may translate spoken words into the user's favorite text language, regardless of whether the person on the other end is speaking English, Spanish, French, or another language. For those who are deaf, this creates additional chances for global conversation and strengthens their sense of global connection.

These applications are quite flexible and can be applied in different contexts. Voice-to-text phone call apps offer a useful option for calls to service providers like physicians' offices or utility companies, as well as for personal calls to friends and family and business calls.

Email and text messaging are the main forms of personal communication for many deaf people. Although these techniques work well, they frequently lack the emotional

XXX-X-XXXX-XXXX-X/XX/$XX.00 ©20XX IEEE

complexity and immediateness of voice communication. With voice-to-text phone call apps, users may communicate with friends and family more directly and personally without the delays that come with written correspondence. Applications for voice-to-text are quite useful in business settings. For instance, they can make it possible for deaf workers to take part in business-related phone conversations with partners, clients, or coworkers without requiring outside assistance. This greater autonomy at work has the potential to improve output and create a more welcoming atmosphere. Making phone calls is necessary in many daily scenarios, such as making an appointment with a doctor or corresponding with customer service agents.

For the deaf and hard-of-hearing community, voice-to-text phone call programs such as Nagish mark a significant leap in communication technology. Through speech recognition and text, these apps allow for real-time, two-way communication, making phone calls convenient, private, and effective. With each new development in technology, the world becomes more inclusive and deaf people have access to new opportunities and increased freedom. Voice-to-text applications are quickly becoming a vital resource for deaf people to improve their connectedness and close communication gaps, whether in social situations, the workplace, or when obtaining basic services.

2.PROBLEM STATEMENT

Creating a smartphone application for Indian regional languages that allows for real-time voice-to-text and text-to-voice translation in order to improve communication for people who have speech and hearing problems. The software should be easy to use, support a variety of Indian languages and dialects, and have a straightforward layout for effortless navigation.

Important Elements to Have: Voice-to-text translation in real-time for regional Indian languages. Text-to-voice functionality that speaks written text aloud in one of the available Indian languages. Indian languages and dialects are supported, and switching between them is simple. a user-friendly interface that is accessible to people with speech and hearing difficulties. Basic translations can be performed offline and without an internet connection with this feature. integration to provide smooth translation during interactions with other communication apps. developed with privacy in mind to guarantee that user data is safe and never shared without permission.

Problems to Be Solved: ensuring excellent voice recognition and translation accuracy while taking into account the variety of Indian dialects and accents. creating a text-to-speech engine with a natural voice and ease of comprehension. designing a user interface that is inclusive and simple to use for anyone with different degrees of technological expertise. App performance is balanced with offline functionality to guarantee that it works in places with spotty internet access. This problem statement uses technology to close the accessibility gap for people with speech and hearing impairments and is in line with the demand for inclusive communication tools. Additionally, it offers a chance to advance speech recognition and language translation technologies.

3.EXISTING SYSTEM

The Nagish App is an innovative communication tool that changes the way deaf and hard-of-hearing people connect with the outside world and make phone calls. Its purpose is to empower these people. The difference between hearing and non-hearing people has been gradually narrowing with the development of digital technology. Nagish goes one step further by offering a user-friendly platform that enables real-time voice-to-text conversion for making phone conversations. With the use of this software, the deaf community may now communicate over the phone with ease and independently without the need of a third party translator or relay service, removing long-standing barriers to communication.

It has always been difficult for those who are deaf or hard of hearing to communicate with others using voice-based systems. There are alternatives to phone calls, such as texts and other written forms of communication, but they don't have the same immediacy and fluidity. Furthermore, there are a lot of situations where voice communication is not only preferable but also required, such scheduling appointments, corresponding with customer support agents, and managing critical situations that call for instant contact.

Conventional methods, such as relay services, which involve an intermediary translating a hearing person's spoken words into text and vice versa, are beneficial but have drawbacks. There may be delays, privacy issues, and occasionally unpleasant situations because of the involvement of a third party with these services.

Voice-based solutions have never made it easy for those who are hard of hearing or deaf to communicate with others. Text messages and other textual forms of communication are alternatives to phone calls, but they lack the same fluidity and immediacy. In addition, there are numerous scenarios in which voice communication is not only necessary but also preferred, such as making appointments, dealing with customer service representatives, and handling urgent circumstances requiring immediate attention. Traditional techniques, like relay services, are helpful but have limitations. They entail having a middleman convert spoken words from a hearing person into text and vice versa. The usage of services by a third party may result in delays, privacy problems, and occasionally awkward circumstances.

Speech-to-text for responses The tool not only translates speech to text but also enables the deaf user to type in response. The text message will then be spoken by the app, and the person on the other end of the phone will hear it as if it were a regular chat. Compared to text-based alternatives, this text-to-speech technology makes sure that communication feels fluid and natural for both parties, enabling a more dynamic connection.

The Nagish App is available to a wide range of users worldwide because it supports many languages. The program will translate spoken words into text in the deaf user's preferred language, regardless of whether the other person

speaks English, Spanish, French, or any other supported language. Since everyone has different needs when it comes to accessibility, the Nagish App provides a number of customization choices to improve the user experience. Users can make the program more visually comfortable for them by changing the font selection, background color, and text size. Because of its high degree of customization, the program may be used by users who have other disabilities, like impaired vision. Many people have serious concerns about privacy, particularly when talking about delicate subjects.

Users of traditional relay systems may find it awkward when a third party interpreter is required to participate in the chat. There is no third party associated with Nagish. The software serves as a communication tool for the two parties on the call. The Nagish App aims to be as user-friendly and straightforward as possible. Users may rapidly set up the app and begin making calls nearly immediately after downloading it. Because of its simplicity, users with different levels of technical expertise can utilize it. The app's compatibility with the majority of smartphones also contributes to its accessibility. Nagish is a flexible tool for everyday communication because it is made to function in a variety of situations. The app enables easy and effective communication, whether it's a personal conversation with friends or family, a business call for work, or a crucial call to a service provider.

Fig.1.Nagish app

The potential of the Nagish App to enable more direct and intimate conversation is one of its primary benefits. For those who are deaf, text messaging is a great substitute for phone calls but, it doesn't have the same emotional resonance or immediate response as voice talks. With the software, deaf users can talk on the phone with friends, family, and loved ones without having to wait for written communication to finish. Answering phone calls connected to work has always been difficult for many deaf people. By allowing users to independently make and receive calls for work-related purposes, whether they are speaking with clients, employers, or coworkers, Nagish offers a useful alternative. This freedom can help deaf people achieve professionally by increasing their self-assurance, productivity, and inclusivity in the workplace.

Making phone calls is a necessary part of many daily chores, from scheduling appointments to answering customer service calls. Deaf people can do these necessary chores more easily with Nagish because they don't have to wait for a written response or have someone else call on their behalf. The software gives users the ability to take charge of their encounters, whether they need to talk to their utility company, bank, or doctor. The Nagish App advances inclusion and accessibility for the deaf and hard-of-hearing population beyond its use as a tool for communication. With the ability to make independent real-time phone calls, the software gives users more privacy, autonomy, and self-assurance.

Technology must continue to advance in ways that support diversity as society grows more linked. The Nagish App is a shining example of how creative solutions can dismantle obstacles and enable people with impairments to interact and communicate with the hearing world on an equal footing. Nagish's intelligent design and potent functionality are contributing to the creation of a more inclusive world. For those who are deaf, Nagish App is a game-changer since it provides independence, privacy, and real-time communication in a way that was not possible before. Millions of individuals now have new opportunities to communicate with the world more freely and confidently than ever before thanks to the app, which bridges the gap between speech and text communication.

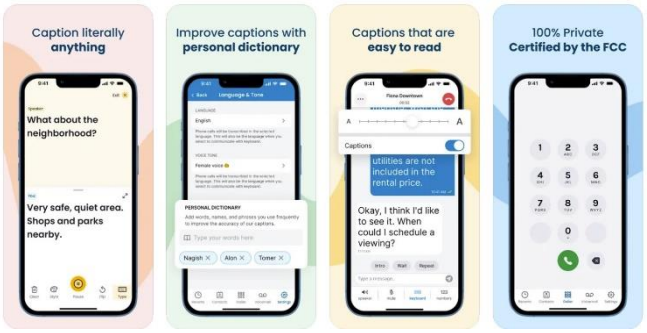

Fig.2.Interface

Identification and Interpretation of Sign Language The Nagish app's innovative capability of translating sign language movements into spoken or written language is another one of its many innovations.

Good communication is essential to an inclusive society and is a basic human right. Communication access in spoken language situations is quite difficult for those who are deaf or hard of hearing. In order to overcome these obstacles, the Nagish app offers a smooth and user-friendly communication tool that translates spoken words into text and sign language in real time, bridging the gap between hearing and deaf persons. Modern technology, including automatic speech recognition (ASR), natural language processing (NLP), and sign language recognition, is integrated into the proposed system to establish an inclusive communication platform that encourages engagement between the hearing and the deaf communities.

Real-Time Translation from Speech to Text Nagish's primary purpose is its real-time transcription of spoken words into text. This is especially helpful in settings where deaf people need instant access to spoken information, like meetings, classrooms, and casual discussions. The system will make use of cutting-edge ASR technologies that are very accurate even in noisy or diversely accented surroundings. Through the use of a microphone, this module records spoken language and converts it.

Using machine learning algorithms that have been pre-trained on massive datasets of spoken language samples, the ASR engine converts the audio input into text. The user may follow discussions as they unfold because the transcribed text is shown on their screen in real time. Customizable User Profiles: Within the program, users can establish customized profiles that reflect their communication preferences (e.g., text vs. sign language) and any additional accessibility requirements (e.g., vibration alerts, text size). The software can customize the experience to meet the specific needs of every user thanks to these profiles. Multi-Device Compatibility the Nagish app will work with a variety of devices, such as desktop computers, tablets, and smartphones. Data security and user privacy are given top priority by the Nagish app. Encrypting all user data and interactions will stop unwanted access. Modern machine learning methods will be utilized by Nagish for gesture and speech detection. Nagish will make use of Natural Language Processing (NLP) technology to give contextual understanding of text and speech in order to improve communication.

This will enable the software to handle complicated sentences, discern between homophones, and guarantee accurate translations, irrespective of the conversation Integration of APIs Through APIs, the app will be able to integrate with other platforms and services. To utilize Nagish's accessibility features across various communication tools, users can connect their Nagish account, for instance, to messaging apps, email clients, or video conferencing platforms.

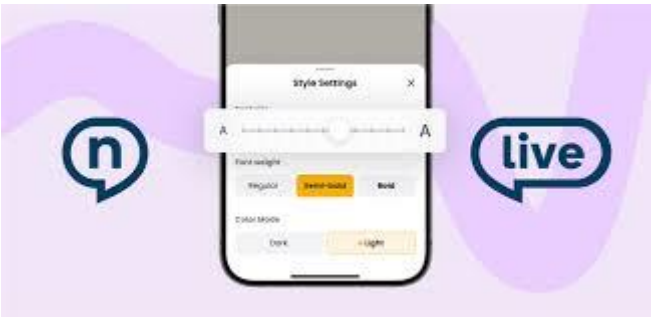

Fig.3.Live Translation

4.PROPOSED SYSTEM

The Iyal App is a cutting-edge real-time communication tool designed with the needs of those who are hard of hearing or deaf in mind. This program aims to remove communication barriers by utilizing breakthroughs in artificial intelligence and speech recognition, in particular, to enable persons with hearing impairments to participate in conversations more easily and naturally. The Iyal App offers a bridge between spoken language and written text, facilitating effective real-time communication in both personal and professional contexts. For a long time, the deaf population has struggled to communicate with non-sign language speakers. Although sign language is a useful tool for communicating within the deaf community, it can be challenging to communicate with others who are not familiar with it.

The Iyal App's real-time speech-to-text conversion is one of its main features. With the use of cutting-edge speech recognition technology, the app can quickly and reliably translate spoken words into text. With the use of this function, users can follow discussions without using manual typing or any extra communication tools like interpreters. The program records spoken words and displays them as readable text on the screen, making it simpler for deaf people to comprehend and reply, whether they are speaking in person or over the phone.

The Iyal App's multilingual support is yet another important feature. The deaf community worldwide is multilingual and has a wide range of languages spoken by its members.

The accessibility of the Iyal App is a top priority. Given that users have different demands, the program provides a number of personalization choices. To fit their desired text display format, users can alter font sizes, background colors, and other visual aspects. This degree of personalization guarantees a more user-friendly experience by enabling the app to adjust to specific needs. Users can concentrate on the discussion instead of the technology thanks to the interface's simple and intuitive design.

You can utilize the Iyal App in a range of contexts, from informal social gatherings to more formal business meetings. During normal conversations with friends, family, or service providers, for example, the app helps deaf people to actively participate without the need for translators. The Iyal App can translate speech into text in real time during professional settings like meetings or presentations, enabling deaf staff members to follow along and meaningfully participate in conversations.

The software can also be a useful resource in educational settings, as deaf students sometimes struggle to follow oral lectures or class discussions. The Iyal App helps level the playing field by giving equal access to information through real-time transcriptions.

The deaf and hard-of-hearing groups continue to face significant communication barriers in a society that values accessibility and inclusivity more than ever. Even though programs like Nagish have helped people communicate more effectively, there is still much that can be done, particularly in countries with diverse linguistic populations like India, which has 22 officially recognized languages in addition to a wide variety of dialects. Furthermore, the usefulness and reach of such applications can be greatly increased by guaranteeing an improved user experience through an intuitive, user-friendly interface. With a better user interface, multilingual support for Indian state languages, and an emphasis on user experience, the planned call application seeks to build upon the foundation laid by the Nagish app.

The suggested call application provides a thorough answer to the communication problems that hard-of-hearing and deaf people encounter. Real-time speech-to-text conversion, Indian sign language (ISL) recognition, support for Indian state languages, and an easy-to-use interface with a focus on accessibility are some of its key features. The software prioritizes inclusion for users who speak various Indian languages in addition to those who are deaf. This is made possible by strong language translation tools that enable real-time communication between users of different languages. Real-Time Speech-to-Text Conversion in Indian Languages:

For users who rely on reading for communication, this feature records spoken words in a variety of Indian languages and transcribes them into text.

Indian language text-to-speech and voice-to-ISL translation: Users can enter text to be translated into speech or ISL, allowing for cross-linguistic and communication hurdles discussion. Improved User Interface: Making major improvements to the interface will guarantee that users enjoy a simple, intuitive experience, reducing frustration and increasing accessibility. Real-time Speech to Text Conversion with Support for Indian Languages The capacity of this call application to translate spoken words into text in real time is one of its most important features it supports a large number of Indian languages, including Bengali, Marathi, Kannada, Tamil, Hindi, and Telugu in addition to English. The linguistic diversity in India is addressed by this feature, as many individuals there prefer to speak in their mother tongue.

Identification and Translation of Indian Sign Language (ISL) Indian Sign Language (ISL) gestures will be able to be recognized and translated by the app. This feature creates a truly inclusive communication platform by enabling hearing people who do not know ISL to communicate with deaf users. Module for Gesture Input: The camera on a smartphone or tablet is used by the system to record ISL gestures. AI for Computer Vision: Sophisticated computer vision algorithms interpret the gestures to identify the particular signs. For high accuracy, this model is trained on a big dataset of ISL motions. For hearing people who might not be familiar with sign language, the identified motions are either translated into text or turned into speech.

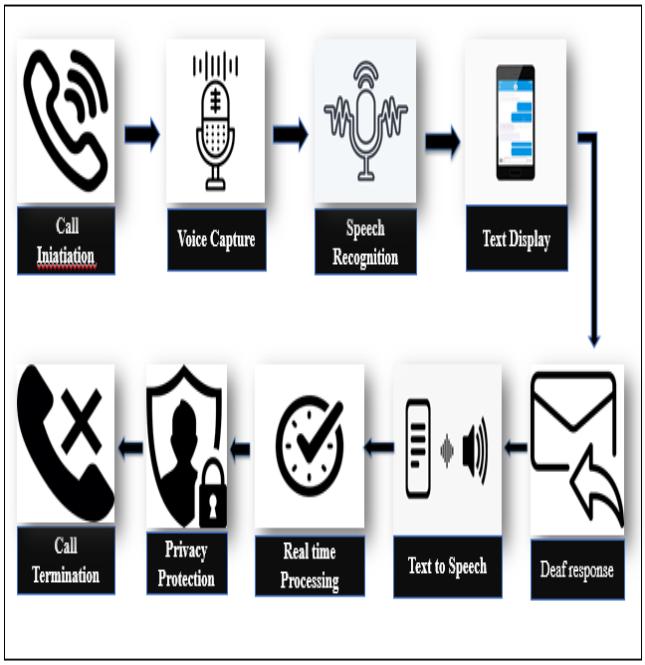

Fig.4.Block Diagram

One of the main objectives of this suggested system is to provide an improved user interface over current apps such as Nagish. The user interface of the app will be created with accessibility as its primary goal, emphasizing usability, customisation, and simplicity. Simplified Navigation a clear, user-friendly layout that reduces superfluous processes would make it easy for users to use the app. Options for Customization: Users will be able to alter the interface of the app to make it exactly as they want it. This involves changing the color scheme, adjusting the font size, and providing high contrast modes for people with vision impairments .Voice and Gesture Controls: In order to improve accessibility even more, the application will provide gesture-based navigation and voice commands, allowing users to operate it hands-free.

The goal of the suggested call application is to transform communication for the deaf community, especially in the linguistically varied country of India. With the ability to convert text to speech, recognize ISL, and perform real-time voice-to-text in a variety of Indian languages, this program will enable users to communicate with ease in a variety of languages and communication styles. The excellent design of the app, which prioritizes customizability and accessibility,

With predictive text capabilities for several Indian languages, the app will provide user-friendly language input. Text can be immediately translated into ISL or speech, based on the user's choice. Users that prefer sign language will be able to sign smoothly and realistically thanks to the responsive and lifelike ISL avatar.

5.ALGORITHM USED

A variety of advanced algorithms power the planned call application for the deaf and hard-of-hearing community, which features an improved user interface and multilingual support for Indian languages. The application's core algorithms guarantee both its performance and functioning in scenarios involving real-time communication. Modern developments in Artificial Speech Recognition (ASR), Natural Language Processing (NLP), Machine Learning (ML), Computer Vision, and Sign Language Recognition are critical to the system's operation. These technologies work together to give the program smooth multilingual support, text-to-speech, sign language translation, and speech-to-text capabilities. The algorithms utilized in the suggested system will be thoroughly examined in this section, along with an explanation of how they cooperate to promote inclusive and productive communication.

One of the most important parts of the call application is ASR. It allows spoken language to be translated into text in real time and supports a number of Indian languages, including Bengali, Kannada, Tamil, Telugu, Hindi, and more. Specifically, Recurrent Neural Networks (RNNs) and their enhanced forms, such as Long Short-Term Memory (LSTM) and Gated Recurrent Units (GRU), are the foundation of the ASR system used in this application. RNNs are excellent at processing sequential input, including speech. After that, this signal is analyzed to extract key characteristics like time, amplitude, and frequency. After these features are recovered, the ASR system finds the closest match by comparing them to a sizable library of previously recorded speech patterns and phonemes. The neural network model uses LSTM or GRU units to maintain contextual information across time steps as it processes these features through a sequence of hidden layers. The ASR algorithm is trained on extensive datasets of Indian languages, encompassing a range of dialects, accents, and geographical differences, in order to provide multilingual support. Here is where transfer learning comes into play, as large amounts of language-specific

training data are not required because pre-trained models for one language are modified for another. The software can smoothly switch between languages as needed since the algorithm learns to distinguish between them based on phonetic and syntactic distinctions.

Problems and Solutions: Indian languages frequently provide particular difficulties, such as a wide range of accents, tones, and rapid speaking. Contextual Speech Recognition, which trains the model on both phonetic and contextual word meaning, is an improvement to the ASR method designed to tackle these issues. This guarantees correct recognition and transcription of homophones—words that sound the same but have distinct meanings—based on the conversation's context. Another essential element of the suggested system is natural language processing (NLP), particularly for multilingual text comprehension, translation, and processing. After the text has been transformed from speech by the ASR, the application uses transformer-based models such as BERT (Bidirectional Encoder Representations from Transformers) and GPT (Generative Pre-trained Transformer) to process the text. Making sure the text is accurately transcribed and pertinent to its context is the primary goal of the NLP system. When a user talks in Hindi, for instance, the NLP algorithm makes sure that the meaning, syntax, and sentence structure are all retained when the speech is transcribed. Furthermore, when users communicate across linguistic borders, NLP algorithms translate across several Indian languages. Multilingual translation jobs are especially well-suited for the Transformer architecture, which serves as the foundation for both the BERT and GPT models. It preserves each word's contextual meaning by using attention processes to focus on multiple portions of a sentence at the same time. Additionally, summaries and contextual predictions are produced by the NLP engines. For example, the NLP model may forecast and fill in missing words based on the conversation's context if background noise or rapid speech makes the voice-to-text translation difficult to understand. Furthermore, by training on parallel corpus of various languages, these models are refined to handle particular language pairs, like translating between Hindi and Tamil or Kannada and Bengali. The differences in sentence construction and grammar norms between languages present one of the biggest obstacles to translation from Indian to English. For example, English has a Subject-Verb-Object (SVO) sentence structure, whereas Hindi has a Subject-Object-Verb (SOV) sentence structure. The NLP models have been refined to identify these structural variations and produce translations that follow grammar rules.

Another essential component of the suggested system is sign language recognition, which allows users who depend on or prefer Indian Sign Language (ISL) to communicate. The program recognizes and decodes user-made sign language motions using Computer Vision and Deep Learning algorithms. Here, the main technique relies on Convolutional Neural Networks (CNNs), which are very good at tasks involving the recognition of images and videos. When processing video data from the user's camera, the CNN model examines each frame in order to recognize distinct hand gestures, facial emotions, and hand shapes. Given that sign language combines non-manual indicators like facial emotions with hand gestures, a sizable dataset of ISL films is used to train the CNN to pick up on these subtleties. In order to capture the temporal dynamics of the movements, the CNN sends the data through Recurrent Neural Networks (RNNs), specifically LSTMs, after the feature extraction phase. Because sign language is dynamic, understanding meaning depends heavily on the order and timing of gestures. In order to ensure that the entire sequence is correctly processed, the LSTM layers assist the system in remembering information about previous motions while processing new ones. Sign language users and non-sign language speakers can communicate easily because once the gestures in sign language are identified, they can be translated into text or voice. A notable obstacle in the recognition of sign language is the variation in gestures among users.

The application's text-to-speech (TTS) feature makes use of Google's Wave Net deep generative model, which is renowned for its capacity to generate speech that sounds very natural. Wave Net simulates human intonation, pitch, and accent variations by modeling raw audio waveforms and learning from large amounts of audio data.

The user's text input is sent into the TTS algorithm, which turns it into natural-sounding speech in the target Indian language. Additionally, users can customize the system by selecting from a variety of dialects, speech velocities, and voice kinds. In a bilingual setting, where users might prefer to hear text in a particular regional accent, this is especially helpful.

Conversely, the application's Speech-to-Sign feature translates spoken or written text into ISL using animated avatars or pre-recorded sign language movies. Both NLP and video creation approaches are used in this. The incoming text is initially processed by the NLP model, which then divides it into sentences or phrases that correspond to sign language motions. Next, the program controls animated avatars that make the corresponding ISL movements or generates real-time video sequences using Generative Adversarial Networks (GANs) or Recurrent Neural Networks (RNNs). Getting the pronunciation of terms that are common in several languages but spoken differently right is a problem for TTS in Indian languages.

A variation of the basic Transformer architecture called the Multilingual Transformer Model allows the application to handle seamless language change across various Indian languages. This approach learns common word and phrase representations between languages, allowing it to process many languages at once. As a result, users can switch between languages in the middle of a chat without the translation losing quality. An individual may begin speaking in Tamil and subsequently transition to Hindi. The phonological and syntactic signals in the speech input are used by the Multilingual Transformer model to identify the language changeover. After that, it modifies its processing pipeline appropriately to guarantee that the speech-to-text conversion proceeds without hiccups.

Real-time language detection is the responsibility of the Language Identification Algorithm. In a few of seconds after speech input, it can correctly identify the language thanks to a combination of statistical language models and phoneme recognition. In multilingual settings such as India, code-

switching—when users switch between languages in a single sentence—is a common problem to handle. In order to ensure that the Multilingual Transformer model can handle these cases with high accuracy, the proposed approach trains it using code-switched datasets. The suggested call application uses a variety of cutting-edge deep learning, computer vision, ASR, and NLP techniques to give hard-of-hearing and deaf users a smooth communication experience. The program incorporates support for Indian languages and Indian Sign Language, thereby guaranteeing the removal of barriers to communication pertaining to both linguistic and physical disability. Neural networks, in particular CNNs, RNNs, and Transformers, provide for context-aware, accurate, and real-time

6.CONCLUSION

The Nagish app provides a ray of hope for people who have speech or hearing difficulties, especially in communities who speak Tamil and Malayalam. Language pride is encouraged, barriers are removed, and equitable chances for participation and communication are guaranteed by the smooth integration of technology and cultural sensitivity. As it develops, Nagish might change the lives of millions of people and establish a standard for creativity in inclusivity and accessibility. Its accomplishments serve as further proof of the ability of technology to build a diverse and inclusive society.

An important turning point in using technology to promote inclusivity and improve communication for groups speaking Tamil and Malayalam is the release of the Nagish app. An excellent illustration of how technology may meet a variety of linguistic needs is the app, which serves as a bridge for those who are hard of hearing by translating text to speech and vice versa.

References

[1] Siri, Cortana, AlexaAmrita S.Tulshan(&)and Sudhir Namdeorao Dhage Department of Computer Engineering, Sardar Patel Institute of Technology, Mumbai 400058, Indiaamrita.tulshan@spit.ac.in, https://nagish.com/post/nagish-benefits-and-features

[2] Manjusha Jadhav, Krushna kalyankar, Ganesh Narkhede, Swapnil Kharose, Survey On Smart Virtual Voice Assistant, Volume:09 Issue:01|Jan2022

[3] https://zeroproject.org/view/project/fbb37452-8e20-48ae-9068-04452c512781

[4] https://www.prnewswire.com/news-releases/nagish-raises-16-million-to-revolutionize-communication-for-individuals-with-hearing-loss-through-ai-302192713

[5] https://hearingreview.com/resource-center/webinars/beyond-audiograms-revolutionizing-hearing-aid-fitting-act-test

[6] https://zeroproject.org/view/project/fbb37452-8e20-48ae-9068-04452c512781

[7] International Journal of Advanced Research in Science, Communication and Technology 10.48175/ijarsct-2140 2021 pp. 212-216

[8] HTML5 differences from HTML4, W3C Working Draft, 24. 6. 2010, http://www.w3.org/TR/html5-diff/, accessed 5. 7. 2010

[9] HTML5, A vocabulary and associated APIs for HTML and XHTML, W3C Working Draft, 24. 6. 2010, http://www.w3.org/TR/html5/, accessed 5. 7. 2010

[10] [Adobe Flash, http://www.adobe.com/flashplatform/, accessed 5. 7. 2010