
TALKING FINGERS

Mohammad Inshal Pinjari*¹, Ketaki Patil*², Achal Patil*³, Madhuri Hivarale*⁴

^{*1,2,3,4}Department Of Computer, SSBT's College Of Engineering And Technology, Kavayitri Bahinabai Chaudhari North Maharashtra University, India.

ABSTRACT

Sign language is the only way to communicate who are unable to speak and hear and also it is a good way for sharing ideas emotions and feelings. Sign language is the preferred method among the deaf and dumb community for communication. Recognition of sign language using a computer and other tools have varying degrees of access. Many other sign language tools and systems have been developed by makers but they are not that cost-effective and even not that flexible to use. Hence in this project report, we introduced a web application that converts audio or text input into the form of sign language gifs and also sign language gestures in the form of text to communicate easily between deaf-dumb and normal people. As we know communication is an important part of everyone's life because it helps us to bond with the world so that it is everyone's right to commune that we thought about Talking fingers because it's a great initiative towards deaf and dumb people. This web app works on video, audio, text recognition to communicate between users.

Keywords: ASL, Talking Fingers, Sign/Gesture Recognition.

I. INTRODUCTION

Most of the normal people do not understand the language which was act by deaf-dumb communities with the normal people and that is the main reason for the communication gap. When talking about the availability of resources for to happen communication t we cannot carry human translators always with us because it is impossible to carry for all the time even for daily activities. Science and technology increasing rapidly so using its newer technologies we can think about an approach that can interpret sign language gestures into the form of text and audio. Deaf-dumb people uses hand signs and gestures for communication whereas normal people facing difficulties to understand their sign language gestures and also deaf-dumb people face same kind of difficulty while communicating normal people. Hence there is a need of a such system which helps to translate text and audio in the form of sign language gif's for to understand deaf-dumb people and sign language hand gestures in the form of text for to understand normal people. So that it bridges the gap of communication between physically challenged people and normal people.

In India some people are speech impaired some having problem with hearing so that they use hand gestures for communicate with each other. However, so many people yet not even know the sign language and they may require an interpreter which is not a convenient option for all the time and it is expensive too. This project mainly aims to narrow the gap of communication by developing web application which can predict the sign language and hand gestures in real time and also convert it in the form of text. To develop such application it requires deep knowledge about the Deaf-dumb culture to understand their linguistic aspects to bridge the communication[1] gap between deaf-dumb people and general people. Different types of image processing algorithms along with neural network are used for to map the gesture to appropriate text in the training data and hence raw images/videos are converted into that particular text that can be read and understand by user.

1. OBJECTIVE

The main objective of this project is to design a possible sign language translator for deaf and dumb people. While sign language is very important to deaf-dumb people, to communicate both with normal people and with them, is still get them little attention from the normal people. We as the normal people, ignore the importance of sign language, unless there one is our family member who is deaf-dumb. Here we are using mobile net techniques and also new technologies like teachable machine tool[2]. Some objectives are given below:

- To help normal people to interact easily with deaf-dumb people.
- Deaf-dumb people will also easily communicate with new technologies.
- To teach normal people sign language in their comfort.
- To be able to understand deaf and dumb people feeling.

- To help people communicate without learning sign language

2. DIAGRAMS

2.1 SYSTEM ARCHITECTURE

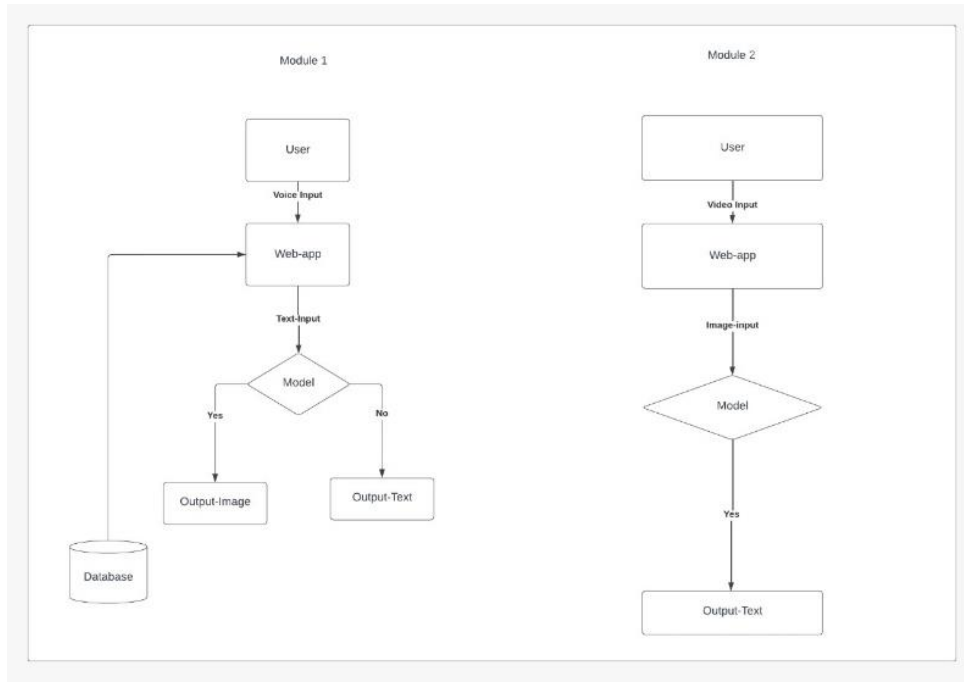


Figure 1: System Architecture

The System Architecture provides details of how the components or modules are integrated and is described with the help of Unified Modelling Diagrams.

The user model consists of three entities:

- **Text and audio Recognition:** First to get text or audio implementation on system to parse the information to further processing.
- **GIF structure:** we have to give number of sign language gif's to system to understand the conversion of text to sign language.
- **Export signs:** Export Sign Language using python libraries to get accurate information.

2.2 DATA FLOW DIAGRAM

Data Flow Diagram (DFD) represents the input and output flow of data through each entity of the system.

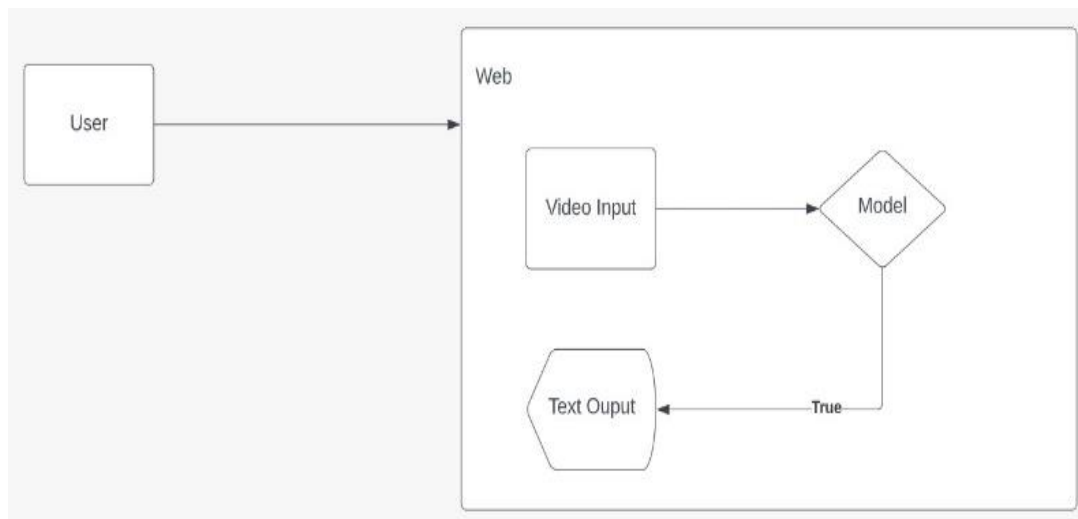


Figure 2: DFD Level 0

In DFD level 0, it shows that user gives video input to system and system will find text output related to that video and gives output according to that.

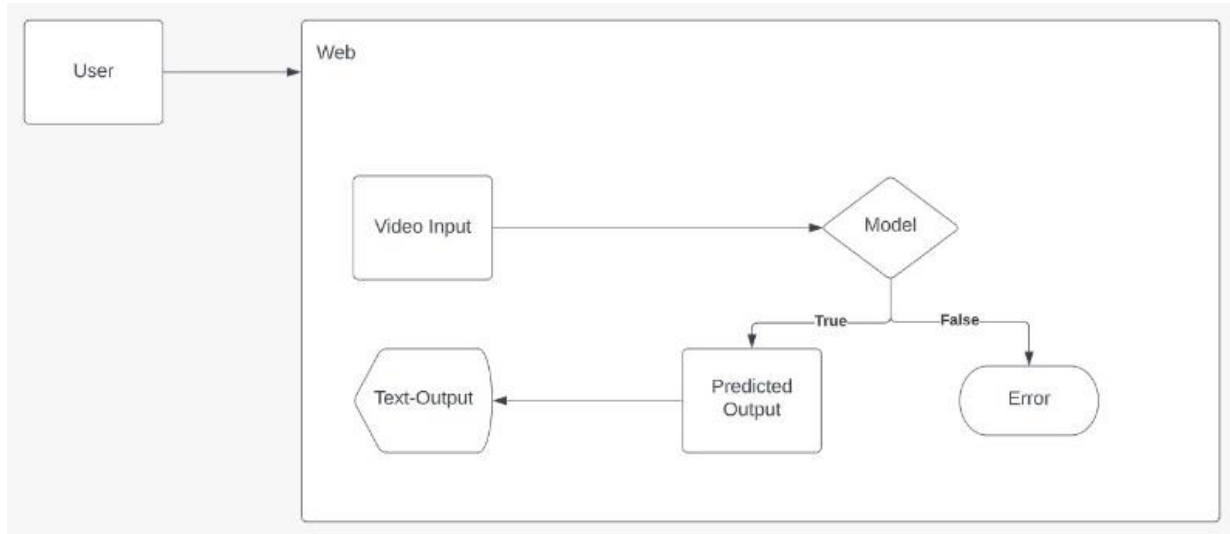


Figure 3: DFD Level 1

DFD level 1, describes the more detailed processes in the system. It shows overall data flow through each process and sub process.

3. ALGORITHMS

Part 1:

1. Start
2. Declare userInput [], outputImage[]
3. Get user voice input.
4. Convert voice-to-text.
5. Assign converted text to userInput[]
6. Separate userInput array
7. Iterate over userInput Array: for(let item in userInput)
8. Check if true then go to (i) else go to (ii),
 - Get file path of a specific item then,
 - Push path in outputImage[] array.
 - Display error "Image not exists"
9. If the output-image is not empty Then, Display gif in a loop.
10. Clear and Record or End.

Part 2:

1. Start
2. Collection of data in terms of multiple classes.
3. Trained data using teachable machine app which used tensorflow model to trained the data.
4. And then done export model.
5. Integrate exported model into web-app.

4. MODULES IN PROJECT

There are two modules in project as follows.

1. Audio/Text to image: Ask the input from the user in the form of text and audio recognize the data which is typed.

Talking Finger

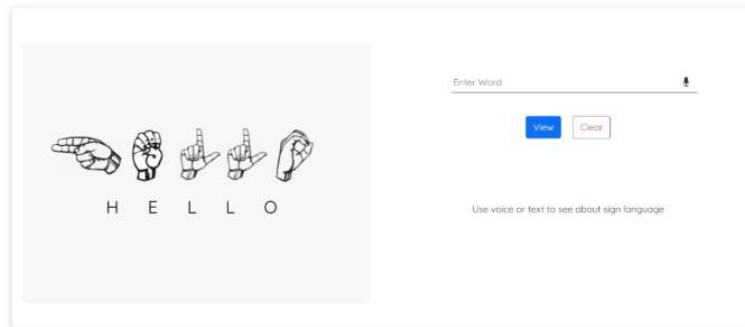


Figure 4: Output in the form of GIF's

2. Image to text: Finding the data from the database according to the input given by the use.

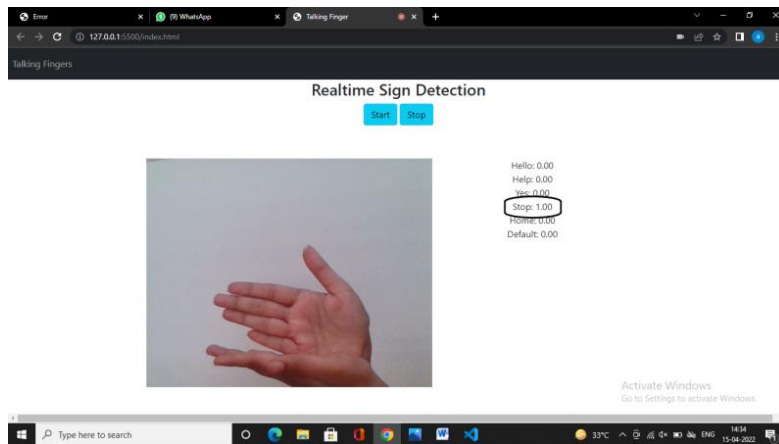


Figure 5: Output in the form of text

II. RESULTS

Talking Fingers is a web application which is basically built to avoid sign language barriers on digital platforms to ease the process of communication. Basically Talking Fingers web application takes text or audio messages from the user. Then this message will find out the data according to the words that are given by user from the data which is stored in the database of it and then it show it in the form of sign language for deaf and dumb people. Then after using the webcam it detects the hand poses and movement and gives a particular sentence by detecting the hand movements to it user(normal person).

III. DISCUSSION

Advantages

Talking Fingers provides following benefits:

- Transfer text and audio in the form of gif able to understand to sign language people.
- Able to detect hand moves.
- Convert hand moves in the form of text so normal people will easily understand.

Disadvantages

- It requires an internet connection.
- It requires large database.

IV. CONCLUSION

From the above points we can conclude that, we are given simple and intuitive solution Deaf-dumb people. This application aims to help the deaf and dumb by providing them with an attractive communication and learning tool[3]. This work introduces a Web-application[3] that enables the communication between Deaf-Dumb and normal people in our society. It also helps to develop a tool which can be used in transportation, hospitals and

restaurants. Moreover, this application introduces an easy translator from voice and text to gif(Sign Language). Much more development on this track can be done as the ASL dictionary is still small and needs to grow eventually.

V. FUTURE WORK

We can convert this application in the form of software so that it can be used with any other social media applications very easily to develop an integrated system for communication for deaf and dumb people. And also add as many more possible varieties of database using multiple sign languages for increasing the dictionary of a web application.

VI. REFERENCES

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