Speech- Sign Language Converter

National Informatics Centre, Chhattisgarh

INTRODUCTION

- According to 2011 census report by the **Government of India**, approximately 4.2 million people are speech/hearing impaired. They communicate using Sign Languages which differ by region and native language.

- With the latest developments in Speech Recognition and AI, we can develop a tool which enables a common man to communicate to such people by converting speech input to video of corresponding sign gesture.

OBJECTIVE

- Enacting Right to Education, speech and hearing impaired students are also to be taught as part of inclusive education.

- However, teacher cannot even give simple instructions to such children due to lack of the knowledge of Sign Language.

- The objective is to develop a tool for teachers to communicate to Divyaang kids by speaking over the microphone for Chhattisgarhi Sign Language. The speech input shall be converted to text followed by a display of sign language gestures in the form of a video.

Developed Application

- A database of 4088 commonly used Hindi Sign Language video clips, including all alphabets and digits are created.

- A web application has been developed with the following functionalities
  - Speaking community can record and upload audio through browser. The audio is converted into text and corresponding sign language is displayed
  - The application also has the option of text input through keyboard, incase speech recognition gives undesirable results.

- The application can be accessed online at https://www.sanket.cg.nic.in

Platform

- Python

- Django Framework

- Google Speech API

- Speech recorder Javascript library

- moviepy

- gtts

Methodology

- The audio is input through browser and uploaded to server.

- Audio at the server end is translated to text using Google Speech API for Hindi language.

- The recognized sentence is tokenized to form meaningful words using the concepts of Natural Language Processing.

- The extracted words are searched in the database for sign clip. In case it is not found we further break a word into letters and form a video out of sign clips of the letters it is composed of.

- A final video is generated for all words of the sentence with due attention to semantics and introducing appropriate pauses.

- Generated video is sent from the server to be played on the browser

Team

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