



# VIT-AP UNIVERSITY

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## CHATBOT USING NLP FOR IMPAIRED PEOPLE

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**Abstract** - In this research, we suggest creating a chatbot that helps persons with disabilities by utilizing natural language processing (NLP). This program not only aids but also directs numerous handicapped individuals. This article presents a solution for visually impaired students who face difficulties in studying text and electronic documents. An experimental prototype is developed using NLP techniques to assist the blind community with information access. The chatbot employs techniques such as automatic index generation, paraphrasing, summarizing, passage retrieval, and query rewriting. The chatbot uses tools such as Torch, Sentence piece, Newspaper3k, and the Natural Language Toolkit to achieve its goals.

The proposed software aims to reduce the time required for writing and understanding compositions, making information access easier for visually impaired students and other people.

**Index Terms** – *Natural Language Processing, Chatbot, Summarizer, Impaired people.*

### I. INTRODUCTION

People with disabilities deal with several difficulties in their daily lives. One of the main challenges they face is communication. Effective communication with other people is challenging for those who have disabilities including visual, hearing, or speech problems. To interact with the outside world, they frequently need third parties' help [4]. However, this reliance on others can be annoying and occasionally result in a sense of loneliness. With the help of the chatbot, people with impairments can communicate with

others quickly and effectively without the aid of a third party. NLP techniques are used by the chatbot to comprehend and interpret user input and answer appropriately. The proposed chatbot is anticipated to help those who have difficulties speaking, hearing, or seeing [1]. By facilitating better communication and information access, the creation of this chatbot is anticipated to improve the quality of life for people with impairments. In the modern world, connecting to the systems aids many people.

Chatbots have gained popularity as communication tools in many industries during the past few years. Using text or voice inputs, chatbots are computer programmes that mimic human conversations. Natural language processing (NLP) techniques are used by chatbots to analyse and interpret user input and adjust their responses. People with impairments now have new options to interact with others more effectively and easily because to the development of chatbots [9].

The goal of this project is to create a chatbot that helps persons with disabilities by utilising NLP. The chatbot is anticipated to give disabled persons a platform to interact with others without the aid of a third party [10]. NLP techniques will be used by the chatbot to comprehend and interpret user input and respond appropriately. The chatbot should be able to help anyone who have difficulties speaking, hearing, or seeing. With the most important points to be noted we must only use the speech or text as an input but not any other input types which might lead us to errors.

## II. MATERIALS AND TOOLS

We are using Python language for programming as it has very large libraries which helps well better in work. And we used Visual Studio platform to run this application and the output comes in speech form.

## III. LITERATURE SURVEY

Chatbots have emerged as a popular technology that provides a conversational interface for interacting with people in natural language. Chatbots are used in a variety of industries, including healthcare, education, and e-commerce. In healthcare, chatbots can be particularly useful in helping people with disabilities. In this literature review, we explore the use of natural language processing (NLP) chatbots for people with disabilities.

1. Chatbots for the visually impaired: Chatbots are particularly useful for the visually impaired because they provide them with an intuitive interface to interact with machines. Researchers have developed conversational robots that can help the visually impaired in many ways, such as identifying very important and controllable objects, reading texts and navigating rooms [2]. For example, researchers developed a chatbot called VIVO that uses NLP and computer vision to identify objects in the user's environment [16].

2. Chatbot for the hearing impaired: Chatbots can also be used to help the hearing impaired. Researchers have developed chatbots that can translate spoken language into text and vice versa, allowing the hearing impaired to communicate effectively with people who do not know sign language [5]. For example, researchers have developed a chat app called Speech Text that uses NLP to convert speech to text and vice versa [15].

3. Chatbot for cognitive disabilities: Chatbots can also be useful for people with cognitive impairments such as dementia and Alzheimer's disease [11]. Researchers have developed chatbots that can help such people by reminding them of their daily activities, playing games and providing emotional support. For example, researchers have developed a chat platform called ElliQ, which uses NLP and machine learning algorithms to learn user preferences and provide personalized recommendations [14].

4. Chatbots for autism spectrum disorder: Chatbots can also be useful for people with autism spectrum disorder (ASD [1]. Researchers have developed chatbots that can help people with ASD in many ways, such as improving their social skills and reducing anxiety. For example., researchers worked to develop a chatbot called Woe Bot, which uses NLP and cognitive-behavioural therapy techniques to help patients with ASD manage their emotions [13].

## IV. RELATED WORK

The existing tools provide text annotation tools, such as bookmarking, note taking, or outlining facilities. However, these facilities are often crude. For instance, the user's access is frequently restricted because he can't easily navigate to a bookmark's location in the original document (for instance, through a hyperlink) or incorporate bookmarks into existing outlines.

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## V. METHODOLOGY

Natural Language Toolkit (NLTK) toolkit and the Python programming language will be used to create the proposed chatbot. A sizable corpus of data will be used to train the chatbot and teach it different linguistic patterns and conventions. To comprehend and analyse user input, the chatbot will make use of NLP techniques such part-of-speech tagging, named entity identification, and sentiment analysis. To connect with users who have speech and hearing problems, the chatbot will make use of text-to-speech and voice-to-text technology.

The following phases will be involved in the chatbot's development:

1.Data gathering and preparation: social media, news articles, online forums, and other sources will all be used to gather a sizable corpus of data. To remove noise, stop words, and other unimportant information, the data will be pre-processed.

2. The NLTK library and Python programming language will be used to create the chatbot. NLP techniques will be used by the chatbot to comprehend and interpret user input and respond appropriately.

3. Evaluation and testing: The performance of the chatbot will be assessed using a variety of scenarios. The chatbot will be judged on its capacity to effectively comprehend, decipher, and respond to user input.

4.This can enable fundamental communication, summarizer output, query retrieval, and inverted indexing to locate a certain word within the sentence.

## 5.BASIC COMMUNICATION

## 6.PARAPHRASER OUTPUT

## 7.SUMMARIZER

## 8.QUERY RETRIEVAL

## 9. USE INVERTED INDEXING TO FIND A SPECIFIC WORD IN THE PROVIDED SENTENCE OR PARAGRAPH

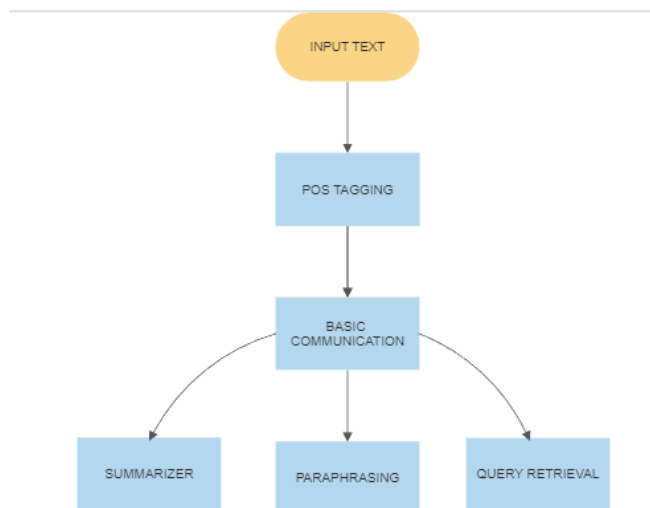


Fig. 1 Flowchart of the process.

It automatically generates useful information on any topic with a few clicks and words. It is developed to make life easier for the blind community. Get access to the right info with ease, as it is read aloud to you. No need for complicated navigation anymore.

## VI. RESULTS

The suggested chatbot is meant to help those who have difficulties speaking, hearing, or seeing. The chatbot will give disabled persons a platform to communicate with others without the aid of a third party. NLP techniques will be used by the chatbot to comprehend and interpret user input and respond appropriately. To connect with users who have speech and hearing problems, the chatbot will make use of text-to-speech and voice-to-text technology. The generated output can be read aloud by our system that is through our computers/Laptops.

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PS C:\Users\badri\Downloads\Fos_bot> & C:\Users\badri\AppData\Local\Programs\Python\Python39\python.exe c:/Users/badri/Downloads/Fos_bot/Fos_bot/verw/text.py
FOS:let's chat! (Type 'Quit' to exit)
You: hello
FOS: FOS-bot is here
You: hi
FOS: FOS bot is ready
You: tell me joke
FOS: What did the buffalo say when his son left for college? Bison.
  
```

Fig. 2 Output for Basic communication in chatbot.

```

You: summarize the text for me
FOS: Enter as many lines of text as you want.
FOS: When you're done, enter a single period on a line by itself.
> volcano, vent in the crust of Earth or another planet or satellite, from which issue eruptions of molten rock, hot rock fragments, and hot gases.
> A volcanic eruption is an awesome display of Earth's power. Yet, while eruptions are spectacular to watch, they can cause disastrous loss of life and property, especially in densely populated regions of the world.
> Sometimes beginning with an accumulation of gas-rich magma (molten underground rock) in reservoirs near Earth's surface, they can be preceded by emissions of steam and gas from small vents in the ground.
> .
Your max length is set to 563, but you input length is only 121. You might consider decreasing max_length manually, e.g. summarizer('...', max_length=60)
FOS: Volcano, vent in the crust of Earth or another planet or satellite, issue eruptions of molten rock, hot rock fragments, and hot gases. While eruptions are spectacular to watch, they can cause disastrous loss of life and property.
  
```

Fig. 3 Output for summarizer in chatbot.

```

You: query
FOS: Enter as many lines of text as you want.
FOS: When you're done, enter a single period on a line by itself.
> volcano, vent in the crust of Earth or another planet or satellite, from which issue eruptions of molten rock, hot rock fragments, and hot gases.
> A volcanic eruption is an awesome display of Earth's power. Yet, while eruptions are spectacular to watch, they can cause disastrous loss of life and property, especially in densely populated regions of the world.
> Sometimes beginning with an accumulation of gas-rich magma (molten underground rock) in reservoirs near Earth's surface, they can be preceded by emissions of steam and gas from small vents in the ground.
> .
FOS: I have processed the document/paragraph, shoot your questions lad I am here to help
what is eruption
FOS: an awesome display of earth's power
  
```

Fig. 4 Output for Query retrieval in chatbot.

## VII. DISCUSSION

There are various benefits for people with impairments using our chatbot. First, the chatbot can help persons with a range of disabilities, such as vision, hearing, and cognitive limitations. The chatbot can also help with communication, information retrieval, and assistance, among other things. Third, by giving disabled individuals access to information and support, the chatbot can enhance their quality of life.

## VIII. CONCLUSION

Creating a chat room for people with disabilities using NLP can be very useful for people with disabilities. Chatbot provides a platform that enables independent and effective communication between people with disabilities and people with disabilities.

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