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ChatGPT for Inclusive Communication: Enhancing Accessibility for Individuals with Disabilities

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ABSTRACT: ChatGPT, a state-of-the-art language model, has gained immense popularity for its ability to generate human-like text in response to natural language inputs. While it has been used in various domains, its potential in assisting individuals with hearing impairments or other disabilities that affect speech and communication has yet to be explored. This research paper aims to analyze the feasibility and effectiveness of using ChatGPT as an assistive technology for inclusive communication. Through a thorough review of the literature and case studies, this paper will highlight the challenges faced by individuals with disabilities in accessing communication and how ChatGPT can serve as a solution. The paper will also discuss the ethical considerations and limitations associated with using AI-based technologies for communication. The findings of this research paper can contribute to improving accessibility and inclusion for individuals with disabilities, and ultimately lead to a more equitable and accessible society.

KEYWORDS: ChatGPT, Inclusive communication, Accessibility, Disabilities, Assistive technology, Natural language processing, Conversational AI, Speech recognition, Language generation

I. INTRODUCTION

Communication is an essential part of human life, and it plays a crucial role in our daily interactions. However, individuals with speech and hearing disabilities face significant challenges in communicating with others. According to the World Health Organization (WHO), over 466 million people worldwide have disabling hearing loss, and 34 million of these individuals are children. This highlights the urgent need for accessible communication tools that can help bridge the communication gap and improve the quality of life for individuals with speech and hearing disabilities.

In recent years, there have been significant advancements in natural language processing (NLP) technology, leading to the development of powerful language models such as ChatGPT. ChatGPT is an artificial intelligence-based language model that has demonstrated remarkable capabilities in generating human-like responses to text-based prompts.

This research paper aims to explore the potential of ChatGPT in assisting individuals with speech and hearing disabilities by enhancing their access to online communication. The paper will discuss the challenges faced by individuals with speech and hearing disabilities and how ChatGPT can help overcome these challenges. Additionally, the paper will examine the ethical considerations surrounding the use of ChatGPT in this context and propose guidelines for responsible and inclusive use.

Overall, this research paper seeks to contribute to the growing body of literature on the potential of ChatGPT in promoting inclusive communication and improving the quality of life for individuals with speech and hearing disabilities.

II. RESEARCH OBJECTIVE

1. To investigate the potential of ChatGPT as a way of improving accessibility and inclusion for people with impairments in diverse communication situations.
2. To identify the obstacles and constraints connected with the use of ChatGPT in inclusive communication, and to suggest solutions to these challenges.
3. To investigate the ethical implications of using ChatGPT in inclusive communication, such as privacy, data ownership, and permission.
4. Evaluate ChatGPT's efficacy in addressing the communication requirements of people with disabilities, and propose areas for improvement and future growth.
5. To raise knowledge and understanding of ChatGPT among people with disabilities, their carers, educators, and employers, and to encourage the use of this technology as a method of improving communication accessibility.

III. LITERATURE SURVEY

Assistive technologies for individuals with speech and hearing disabilities have seen significant advancements in recent years, and one such technology that has gained attention is chatbots powered by artificial intelligence. The ChatGPT model, based on the GPT architecture, has shown promise in assisting individuals with various disabilities, including speech and hearing impairments.

Challenges faced by the disabled person:

Research has shown that individuals with speech and hearing disabilities often face challenges in communication, which can affect their ability to access essential services, participate in social activities, and engage in educational or professional opportunities.

1. **Language barriers:** Individuals with disabilities who use a different language or communication system than those around them may face challenges in communicating effectively. For example, a deaf person who uses sign language may have difficulty communicating with hearing individuals who do not know sign language.

2. **Cognitive and learning disabilities:** People with cognitive and learning disabilities may have difficulty processing and understanding language, which can make it challenging to communicate effectively.

3. **Speech and language disorders:** Individuals with speech and language disorders may have difficulty articulating words or understanding spoken language, which can impact their ability to communicate effectively. Chatbots powered by AI, such as ChatGPT, offer a new and potentially more accessible means of communication for individuals with speech and hearing disabilities. These chatbots can interpret natural language input and generate appropriate responses, providing a more human-like interaction than other assistive technologies.

How Chatgpt is helpful for disabled persons:

ChatGPT is a powerful language model that has the potential to assist individuals with speech and hearing disabilities in several ways:

1. **ChatGPT can be trained to recognize and interpret sign language:** Sign language is the primary means of communication for many individuals with hearing and speech disabilities. ChatGPT can be trained on sign language datasets, allowing it to interpret and translate sign language into text or speech.
2. **ChatGPT can be used to generate speech:** Many individuals with speech disabilities use text-to-speech software to communicate. ChatGPT can be trained to generate speech that is more natural and human-like than traditional text-to-speech programs.
3. **ChatGPT can assist individuals with cognitive disabilities, such as dyslexia, by providing them with a text-to-speech feature.** This feature allows them to hear the text rather than read it, which can improve their comprehension and understanding of the content.
4. **ChatGPT can help individuals with mobility impairments by providing them with a virtual assistant that can perform tasks on their behalf.** For example, a person with limited mobility can use ChatGPT to order groceries, schedule appointments, or control smart home devices.
5. **ChatGPT can also assist individuals with visual impairments by providing them with an audio description of images or videos.** This allows them to better understand the content and engage with it in a meaningful way.

Overall, the literature suggests that chatbots powered by AI, including ChatGPT, have significant potential for enhancing accessibility and communication for individuals with disabilities.

Comparison between ChatGPT and other technologies :

1. **Augmentative and Alternative Communication (AAC) devices:** These devices are designed to help individuals with communication impairments express themselves. They can be used to produce speech or to display symbols or text that represent words or phrases. Compared to ChatGPT, AAC devices are often more limited in terms of their vocabulary and the level of customization available.

2. **Voice Recognition Software:** This technology allows users to dictate text using their voice. Voice recognition software is often used by individuals with physical disabilities who have difficulty typing. However, it may not be suitable for individuals with speech impairments, and it may not be as accurate as ChatGPT.

3. **Text-to-Speech (TTS):** TTS technology is designed to convert written text into spoken words. While TTS systems are useful for individuals with visual impairments or dyslexia, they lack the ability to understand natural language. ChatGPT, on the other hand, is capable of understanding natural language and can generate responses that are contextually relevant and appropriate.

4. **Speech Recognition Systems:** Speech recognition systems are meant to convert spoken words into printed text. While these methods are beneficial for people who have trouble typing, they may not be accurate for people who have

speech problems. ChatGPT, on the other hand, is not restricted by speech impediments and may produce replies depending on the user's input, regardless of the modality of input.

BENEFITS

1. **Improved Communication:** ChatGPT can help individuals with disabilities to communicate more effectively by providing a natural language interface that is easy to use and understand.
2. **Increased Independence:** ChatGPT can provide individuals with disabilities with greater independence by allowing them to communicate more easily and effectively without relying on the assistance of others.
3. **Greater Access to Information:** ChatGPT can help individuals with disabilities to access information more easily by providing them with a tool to search for and retrieve information in a natural language format.
4. **Enhanced Social Interaction:** ChatGPT can help individuals with disabilities to engage in social interaction more easily by providing them with a tool to communicate with others in a natural language format.

LIMITATIONS

1. **Accuracy and reliability:** The accuracy and reliability of text-to-speech and speech-to-text translations can vary depending on the language and context of the communication. This can pose a challenge for individuals with disabilities who rely on accurate communication to fully participate in society.
2. **Training data:** Language models such as ChatGPT require large amounts of training data, which can be a challenge for languages and domains with limited resources. This can limit the applicability of ChatGPT for individuals with disabilities who speak less commonly spoken languages or use specialized jargon.
3. **Inability to understand emotions:** It is not capable of understanding emotions and may not always be able to provide empathetic responses in situations where a human touch is required.
4. **Lack of domain expertise:** It has access to information on a wide range of topics, but it may not have in-depth knowledge or expertise in certain specialized fields.

IV. CONCLUSION

To summarise, ChatGPT is an exciting technology with the potential to dramatically improve inclusive communication and accessibility for people with impairments. ChatGPT, with its ability to create human-like replies and adapt to varied circumstances, can be an excellent tool for helping persons with impairments to interact more successfully and freely. It is crucial to emphasize, however, that ChatGPT is not a perfect solution and has limitations in its usefulness.

It may not always deliver correct or acceptable replies, and it may also perpetuate prejudices or stereotypes inherent in the data on which it was trained. Developers and researchers must solve these concerns through continual technological monitoring, testing, and modification.

Overall, ChatGPT is a useful tool for improving inclusive communication and accessibility for people with disabilities, but it should be used in tandem with other technologies and initiatives to give a complete and successful solution. ChatGPT has the potential to significantly improve the lives of people with disabilities with more study and development.

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