Literature survey:

Many of us think that artificial intelligence represents an abstract and futuristic notion we only see in sci-fi films with humanoid robots and holograms. However it's more and more grounded in our reality reaching various fields and categories of people including people with disabilities. Artificial intelligence truly revolutionizes accessibility and inclusion! Thanks to AI technology solutions, people with disabilities can drastically improve their everyday lives.

We had previously seen that **smartphones** are a powerful tool that help users with a visual impairment. Indeed, many apps enable them to remain autonomous. For example, thanks to Seeing AI, visually impaired people can easily read their mail by placing documents under the smartphone camera. AI technology can apply to any type of disability profile. For instance, people with reduced mobility can control everything at home just by using their voice with a virtual personal assistant such as Amazon Alexa.

Let's take a look at AI and how it can enhance accessibility thanks to a few examples of innovative solutions! The future starts now!

Communicating with others and being connected:

Depending on the type of disability and profile, communicating with others can be a challenge. The same holds true for staying connected to others in a world that's more and more digitized with the growing importance of social media and our dependence to the Internet. But technology and AI leave no one behind and can be at the service of people with disabilities. A lot of apps use artificial intelligence to favor accessibility.

Exisiting solution:

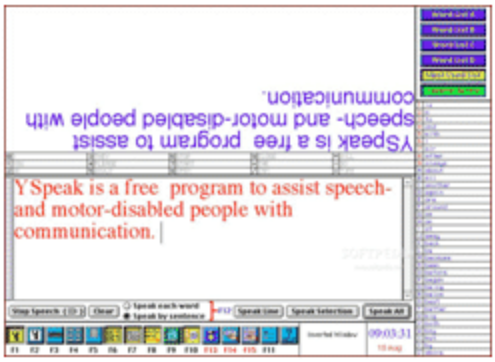
Google Maps: one of the most used GPS apps around the world. Visually impaired people or wheelchair users can prepare their trip in advance and visualize their route and the best means of transportation to use according to their profile. Thanks to the "wheelchair accessible" option, wheelchair users can know where ramps and elevators are located in the city. Plus the feature "accessible places" is useful for them to have more information about the layout of many premises: entrance, parking spots, restrooms, seating arrangements… This feature is also used by people with a visual impairment to find the exact location of a building entrance.

Soundscape: an app that describes blind people their surroundings with audio 3D technology. They can easily be aware of the points of interest near them and the intersections. Quite convenient to enjoy the city.

Wheelmap: it lists and maps all accessible public venues (restaurants, shops, cafés…). Even users can add data and information concerning the accessibility level of places.

Technical paper:

The main purpose of this research is to enhance the communication of the disabled community. The authors of this chapter propose an enhanced interpersonal-human interaction for people with special needs, especially those with physical and communication disabilities

	
YSpeak program (Softpedia, 2009)	TextAloud Splash (Macsolvers' Blog, 2009)
	
Talk Back 12 devices (Crestwood Communication Aids Inc, 2009)	STANDUP PUN user interface (Standup, 2006)

The proposed model comprises of automated real time behaviour monitoring, designed and implemented with the ubiquitous and affordable concept in mind to suit the underprivileged. In this chapter, the authors present the prototype which encapsulates an automated facial expression recognition system for monitoring the disabled, equipped with a feature to send Short Messaging System (SMS) for notification purposes. The authors adapted the Viola-Jones face detection algorithm at the face detection stage and implemented template matching technique for the expression classification and recognition stage. They tested their model with a few users and achieved satisfactory results. The enhanced real time behaviour monitoring system is an assistive tool to improve the quality of life for the disabled by assisting them anytime and anywhere when needed. They can do their own tasks more independently without constantly being monitored physically or accompanied by their care takers, teachers, or even parents. The rest of this chapter is organized as follows. The background of the facial expression recognition system is reviewed in Section 2. Section 3 is the description and explanations of the conceptual model of facial expression recognition. Evaluation of the proposed system is in Section 4. Results and findings on the testing are laid out in Section 5, and the final section concludes the chapter

Reference link:

https://www.researchgate.net/publication/265093860_A_Face_Based_Real_Time_Communication_for_Physically_and_Speech_Disabled_People

Author:

Ong Chin Ann

PSB Academy · School of Engineering & Technology

BMm, MSc (Australia), CTFL, SMIEEE (USA), MACS CP (Australia) MSCS (Singapore)