

Voice Assistant for Visually Impaired People

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Abstract - - As of today many people suffer from Visual Impairment. It one of the biggest problem's humankind is facing today. Frequent assistance is required for them to be able to perform day to day tasks. Earlier Braille type of paper was used to read. Although it's still in use today it is gradually becoming outdated as it is restricted to only reading and cannot suffice the needs and perform other tasks of the visually impaired. In today's technologically advanced world Computer Vision based solutions and android based solutions are emerging as one of the most promising due to their accessibility and the technology used which enables them to perform a wide range of tasks. This paper discusses the latter solution. The solution aims to create an application for visually impaired in which text and speech commands are accepted from the user and the tasks are performed. The application is created by using JAVA programming language on the open Android Studio platform.

Key Words: Text-to-speech, Visual Impairment, Navigation, Optical Character Recognition, Web Browsing

1. INTRODUCTION

The World Health Organization (WHO) estimates that 253 million people live with visual impairment. 217 million of those have moderate to severe vision impairment and 37 million are blind. Traditionally, Tools like stick were used from decades to avoid obstacles. Keeping pet dogs or guide dogs were one of few techniques used by the visually impaired. Some took help of their family and friends for assistance. However, these techniques and tools had drawbacks. People with trained dogs needed money and time to feed and train the dogs. In today's technologically advanced world the above techniques cannot suffice the needs of the visually impaired people. Smartphone today has become a must-have device. It performs multiple tasks like telling time, messaging, calling, etc. Tasks which visually impaired are in dire need of. Through the help of technology solutions can be created to rectify the problems visually impaired people face in day to day life. It would have a positive impact on their lives and make their day to day life easier.

2. Literature Survey

Many researchers have contributed to this field. Various combinations of existing technologies have been used. Braille systems, screen magnifiers, etc. went through some developments but later faced technical issues.

The fusion of several sensors is one of the techniques used for obstacle detection [1], where combination of visual sensors, sonar and inertial measurement unit are used to detect the presence of an obstacle and give audio as well as tactile feedback to user. Another system was to implement OCR using Raspberry Pi sensor for automatic recognition of the environmental messages and by utilization of TTS [2].

Android phone-controlled voice gesture and touchscreen operated wheelchair where voice and gesture is recognized through android [5]. Developers also created a universal voice control on android which is used to launch android application via voice commands [10].

3. Proposed System

The proposed system is to build an customized application for visually impaired people. This application acts as a voice assistant. This application is used to help the visually impaired to access most important features of the phone using text to speech and speech to text.

The System will have custom messaging feature, call log feature, notes making feature, OCR feature, web browsing feature, navigation feature in it. This system will speak out all the actions performed by user. This system in all is a voice assistant for whatever action the user has performed though a custom app.

The custom app having these features will allow visually impaired users to do their basic things using electronic device without any other help.

3.1 Modules

Messages: The user can check messages from our custom app. They can check in two forms inbox and sent. When User will select the system will speak out contents of it.

Calls: The user can check call logs from custom app. Also, user can use dialer. When User will select the contact the system will speak out as when last call received with time.

Notes: The user can add, make, edit and save notes from this custom notepad. It also includes custom made keypad. When user press the key, the system will speak out letting users know which key they are pressing.

Text to Speech: All the actions performed even the reminders are spoke. Since visually impaired people are able to see, this system is used to recite everything. It normally converts a normal text into speech.

OCR: This system capture text images from the camera and extracts the text from the image with clear perception. With help of Text-to-Speech engine the text will be read for the user.

Navigation: This system uses Google Map Api to show and speak out to the users their current position and also perform other tasks. It will be beneficial for them to navigate and walk by knowing their position.

Web Browsing: This system uses internet browser with help of speech to text and searches and speaks out the required result for the user. User enters whatever they want to search through speech recognition and the system will speak out the results for them.

4. System Diagram

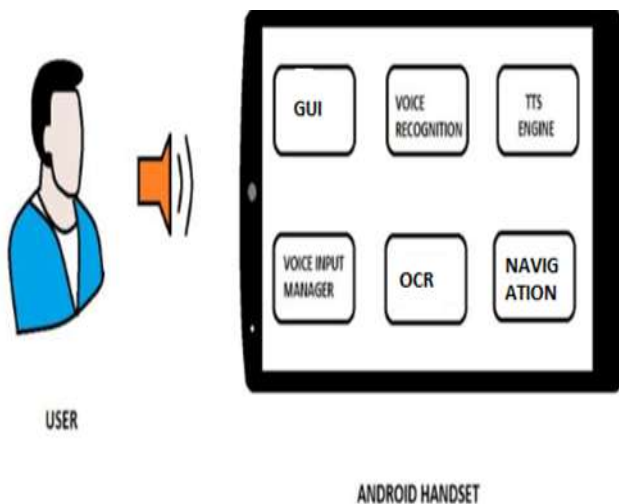


Fig -1: Proposed System

3. CONCLUSION

In this paper, we had proposed a much helpful voice assistant for visually impaired people. This system will be very easy to use. This application will run on Android operating System. This Voice assistant is very helpful towards the visually impaired people and makes very easy for them to use electronic gadgets with (text to speech) TTS technology, they will be able to interact more efficiently to the electronic system i.e Mobile Phone, Tablets etc.

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