

Dream Eyes – A Sight to Low Vision People

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Received Date February 19, 2023

Accepted Date: March 25, 2023

Published Date: April 06, 2023

ABSTRACT

In a day-to-day lifestyle, partial eyesight may cause young generation people to suffer from multiple problems by the usage of mobile phones, etc. What about their condition after they become old in the future? This may lead to a situation where these persons must depend on others for their work to be done. To help these people in these conditions, the solution is proposed which is known as "Dream Eyes". The proposed Android-application helps to overcome these issues. An old man will be able to read and write with his/her spectacles, suppose the old person is unable to read, then in such condition the people can use the proposed application. To achieve the proposed solution a successful collection of frameworks like OCR (Optical Character Recognition), TTS (Text to Speech) is used, which enables us to hear the scanned text using a phone or tablet.

Key words : Text to Speech, Optical Character Recognition, Artificial Eye, Dream Eye

1. INTRODUCTION

There are so many old people who are facing several visually challenges every day in the form of reading, writing, etc. It has been a very difficult situation for them to find out whether they are consuming prescribed medicines or not which is essential to maintain a healthy life throughout their lifespan [1]. In order to serve the purpose of effective communication between two parties without hindrances, many applications have come to picture, which acts as a mediator and help in effectively carrying messages in form of text, or speech signals over miles of networks. Most of these applications find the use of functions such as articulatory and acoustic-based speech recognition, conversion from speech signals to text, and from text to synthetic speech signals, language translation amongst various others. There are so many applications that already exist in the market but

unfortunately, they are not user-friendly for old people to their capabilities and probably some of them are illiterate too [2].

Lets bring a scenario that we can see that older people are relatively dependent on their medicines for their health maintenance. Suppose every family member is out for their work and no one is present at home to help. In such a case, the old person present at home may find it very difficult to identify which medicine must be consumed at that particular time. He may wonder how to identify the medicine to be consumed? Isn't it! The old person shouldn't consume wrong medicines at the wrong time which may again lead to multiple problems. In Text-To-Speech we are using Web API, and Speech Synthesis API, to convert Texts to speech in different voices. Text-To-Speech Synthesis is a Technology that provides a means of converting written text from a descriptive form to a spoken language that is easily understandable by the end user (Basically in English Language).

2. OVERVIEW

The proposed application "Dream Eyes: An Android Application to Assist the Visually Impaired" is an Old People Assistance Tool. We have developed an application to reduce the problem that is faced by old people while reading the printed text.

There are few applications are existing for the above problems. Mobile access technologies have been developed for old people. They are unique hardware devices with functions that perform specific operations. Optical Character Recognition, Color identifiers, and vocal barcode readers are very expensive as they require dedicated hardware and supporting environment. Thus these features lead them to limited usage [3]. In the present era, mobile devices have a set a different level of standards which allows blind people to use unique features like reading a screen (Screen Reader) software which is free of cost when it comes to all Apple iPhone and Google Android platforms that use 3G Networking Systems [4].

Though many applications have been developed from human-powered access technologies, its capabilities are extremely limited. When we consider the oMobyapplication, it performs object recognition by making use of computer visions as well as computations performed by humans. Many visionless applications came into picture which was developed to give precise results for the users. When we consider the application Google SMS, it was a unique messaging system that processed automated text messages through voice input for a limited number of topics [5].

Unfortunately, due to multiple drawbacks, these applications did not give effective impact or its existence to people. The following are the objectives of our proposed solution. They are:

- The application turns the printed text into voice output.
- Once the image data (text in a single column) is recognized & transformed into text content, you'll be able to playback that text.

3. MOTIVATION

Eyes are the beautiful featuring sense given by the god, to feel and see whole world environment, "EYES" are very important in our life, without eyes we are not able to do anything of our own this leads to visually impaired people to face difficulties in reading, writing, etc. Hence this application created to reduce the difficulties faced by the visually impaired old people to read the printed text [6].

The below figure 1 shows the statistics and represent the information regarding the number of people who suffer from partial blindness. Almost 82% of people after the age of 45 years are victims of this situation. When youth at age of 11-30 years have vision accuracy around 85% it's up to us to ensure that we can help the older people by trying to implement something that may become a solution to reduce their problem. When people like Jorgen Wiberg have taken initiatives to render a helping hand to them, we computer science engineers decided yes why not? Everything is possible in this world. Let us be a help to our people first then this help will automatically carry to society as well [7].

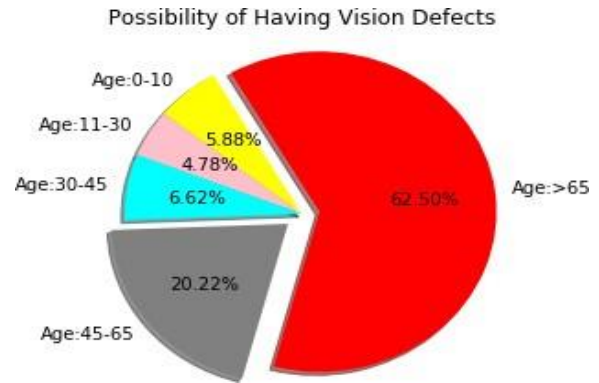


Figure 1: Possibility of having Vision Defects

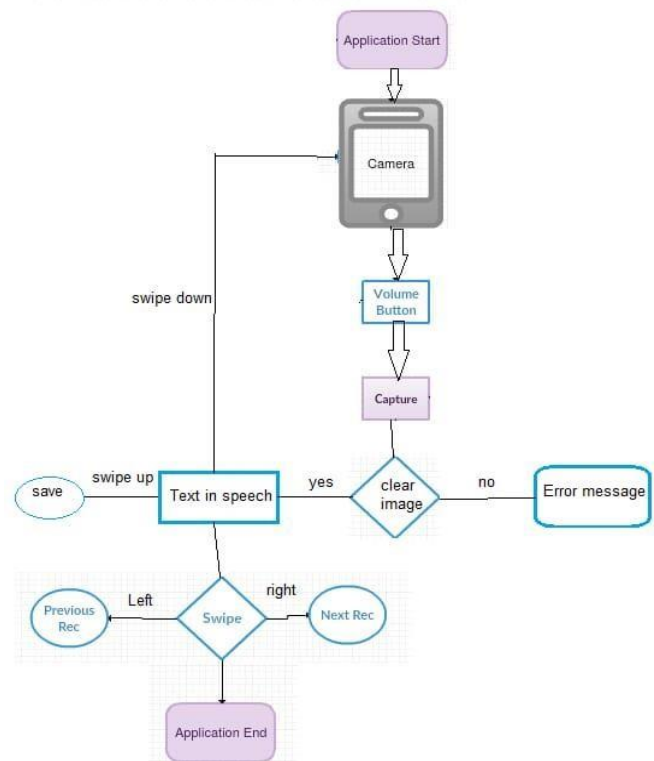


Figure 2: Flow Diagram of Proposed System

4. PROPOSED SYSTEM

In this application, an OCR (Optical Character Recognition) is being integrated and a TTS (Text To Speech) technology. The proposed application uses a camera to get the images which are given as input to the OCR subsystem which extracts the text from the image. This text is then given as the input to the TTS subsystem which converts it to audio. The Figure 2 above shows the flow diagram of proposed system.

The following are the phases of our proposed solution as shown in the below figure 3:

- Capture the image of the printed text.
- To recognize the text using OCR.

- Segment the individual words and characters from the scanned page into lines, words, and characters.
- Convert the segmented text into audio information

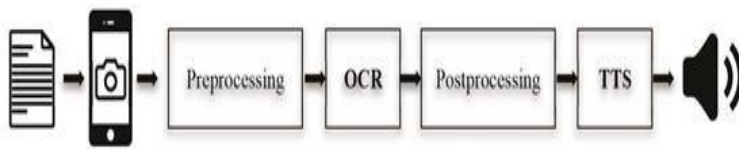


Figure 3: Architecture of Proposed System

5. METHODOLOGY

The proposed solution is developed as follows.

- Once the application is opened it should directly open the camera screen
- When the volume Up or Down button is pressed it should read it as capture input
- Touch should provide the focus of the image so that it should be helpful for parsing text from the image taken by the camera screen
- Once the picture is taken the application should start processing the image and should keep searching for the text in an ordered way that the text is not crumble or misplaced
- Once the application successfully parses the text from the image processing method with the help of machine learning techniques it should be stored in a temporary file so that it could be read.
- After the text parsing and storing the application should start speaking the that was captured from the image
- On swiping up the text should be stored in database for future uses.
- On swiping down the camera screen should get opened
- On swiping right the next stored text from the database should be fetched and application should speak the text.
- On swiping left the previous stored text from the database should be fetched and application should speak the text.
- When the clear button is pressed it should clear the text displayed on the screen [6]. The proposed methodology is shown in the below figure 4 and the use case diagram in the figure 5.

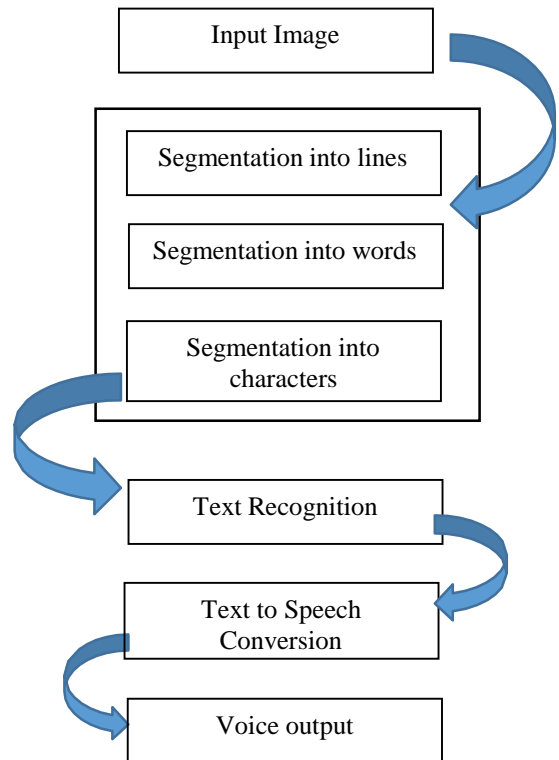


Figure 4: Proposed Methodology of Scanned Image to Voice

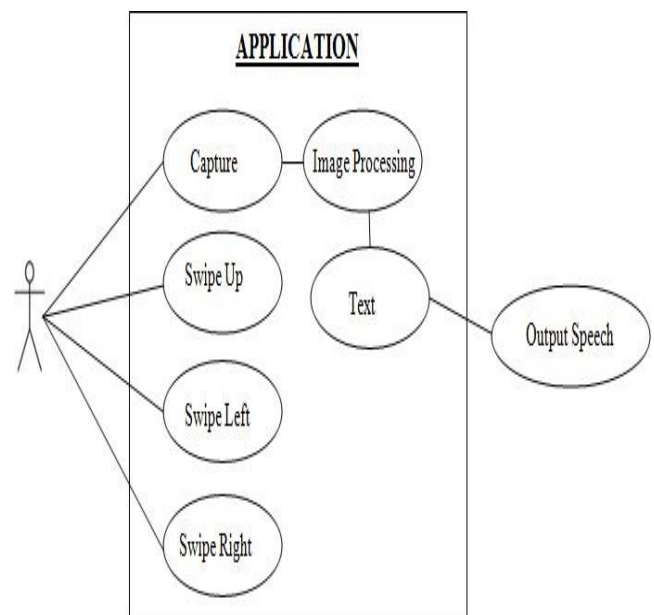


Figure 5: Use case diagram

6. RESULTS

The application is well developed to help the old people and the people who can see things but have a problem in reading, it can also help the people who have sight problem who can't read the text easily and face difficulties to read the text. The application is developed successfully in such a way that it can capture image very easily with the click of volume button and which in turn is processed and text is extracted and not only that, the text is converted to speech so that the user can hear

the reading of the text that they captured. This application has a very simple and quick learn guide with just swipe where every swipe means action. The accuracy of the vision and the statistics are shown in the below figure 6.

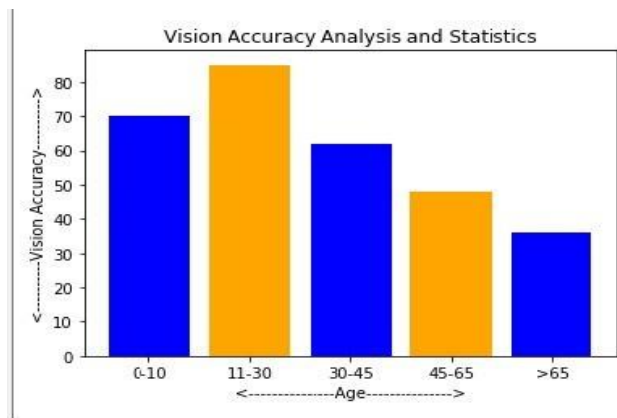


Figure 6: Vision Accuracy Analysis and Statistics

7. CONCLUSION

The application is developed to help the old people and the people who can see things but have a problem in reading, it can also help the people who have sight problem and can't read the text easily or face difficulties to read the text. The application is developed successfully in such a way that it can capture image very easily with the press of volume button and also it can capture the image containing text, which in turn is processed to extract the text. The Extracted text is converted to speech so that the user can hear the text what they captured. This application had a very simple and quick learn guide with just swipe where every swipe mean action and this feature made the application User-Friendly for old people as finding buttons on the screen is not easyfor them.

This application provides a helping hand or light to the darkness carried out by low vision people as they are facing a lot of challenges in their day to day life. With a still photograph and an audio description the application answers to the problem faced by them quickly but asynchronously. So these technologies or platforms provided by Google Vision is a boon to present society. We must be aware of them and we must use these platforms efficiently and effectively. When a lot of technologies have been implemented in the development of a society and an helping hand to helpless people who can do their work on their own and lead a peaceful life.

There may arise some situations where the helpless people may need continuous information that helps them to convey something to be done. The implemented system finds its application in image-to- text conversion. It can be enhanced to extract text from both high quality and low-quality images. An

interactive application can be developed by adding Machine Learning techniques and also able to scan the handwritten text too. The above application can also be enhanced by giving local language recognition and we can use this text tottranslate them into the local language and readout.

REFERENCES

1. Vouk M A: Research and Implementations, Journal of Android Computing and Information Technology, 2004 Eugene Ciurana. *Developing with Google App Engine*
2. Maurizio Gibin, Alex Singleton, Richard Milton, Pablo Mateos, Paul Longley. 2008. An exploratory cartographic visualization of London through the Google Maps API. *Springer: Applied spatial analysis and policy*, Volume 1 Issue 2 (July. 2008), 85-97.
3. Dan Sanderson. *Programming Google App Engine: Build & Run Scalable Web Applications on Google's Infrastructure*. (October. 2012)
4. Zhang Qi, Lu Cheng, Raouf Boutaba: *Journal of Internet Services and Applications* May 2010, Volume 1, Issue 1.
5. The Braille Literacy Crisis in America Facing the Truth, Reversing the Trend, Empowering the Blind by the National Federation of the Blind Jernigan Institute March 26, 2009
6. Milios Awad, Jad El Haddad, Edgar Khneisser, Tarek Mahmoud, Elias Yaacoub, Mohammad Malli- *Intelligent Eye: A Mobile Application for Assisting Blind People in IEEE Middle East and North Africa Communications Conference (MENACOMM)*, (2018).
7. Joe Yuan Mambu, Elisa Anderson, Andria Wahyudi, Gerent Keyeh, and Billy Dajoh- *IEEE Blind Reader: An Object identification Mobile based application for blind using augmented reality detection* (2019)