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Androeye: For Visually Impaired People

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Abstract : *Disability of visual text reading has a huge impact on the quality of life for visually disabled people. Visual impairment is now increasing rapidly, especially in these days when information is communicated a lot by text messages rather than voice. In this project, we developed an application that converts an image to text and then to speech. The basic framework of this system is that it captures an image, extracts only the region of interest (i.e. region of the image that contains text) and converts that text to speech, text and removes the background noise.*

Keywords: *Image to speech, optical character recognition, text to speech, visually impaired*.

I. Introduction

As reading is of prime importance in the daily routine life (text being present everywhere from newspaper, commercial products, sign-boards, digital screens etc.) of mankind, visually impaired people face a lot of difficulties. Therefore, to provide an access to information, so that they will be self-independent. Our application assists the visually impaired by reading out the text to them from the image. This application helps to reduce the dependence of visually impaired people on others for communication. Visually impaired people are unable to recognize currency by themselves. So we introduced applications which have a local database to solve this problem. We also introduced a geo-positioning system in our application to detect the user's location of by using longitude and latitude. And also tried to provide a unique solution by using barcode system for daily tasks.

II. Aim And Objectives

Existing systems for text recognition are limited either by explicitly relying on specific shapes or color or by using user assistance or may be of high cost. Therefore, this project aim is to provide a system which is cost effective as well as user-friendly. It provides an application which is user friendly, cost effective and applicable in real-time. Also enable visually impaired people to become independent and self-reliant as they will no longer need assistance to understand printed text and recognizing Indian currency. And help in reading out the information about the product which is binded in the barcode.

III. Application And Scope

The application is user friendly, cost effective and applicable in real-time. By this approach we can read text from document, web page or e-book and can generate synthesized speech through mobile phone's speaker. It has set all policies of single corresponding to each and every alphabet, its pronunciation methodology, the way it is used in grammar and dictionary. People who do not had the ability to read or write can also use this application. This application can also be used in parts- if we want only text conversion, it is possible and if we want only text to speech conversion, it is also possible. People with poor vision or visual dyslexia or totally blindness can use this for reading documents and books. People with speech loss or totally dumb can utilize this to type words and convert into speech

IV. Proposed System

The proposed system consists of four different features such as

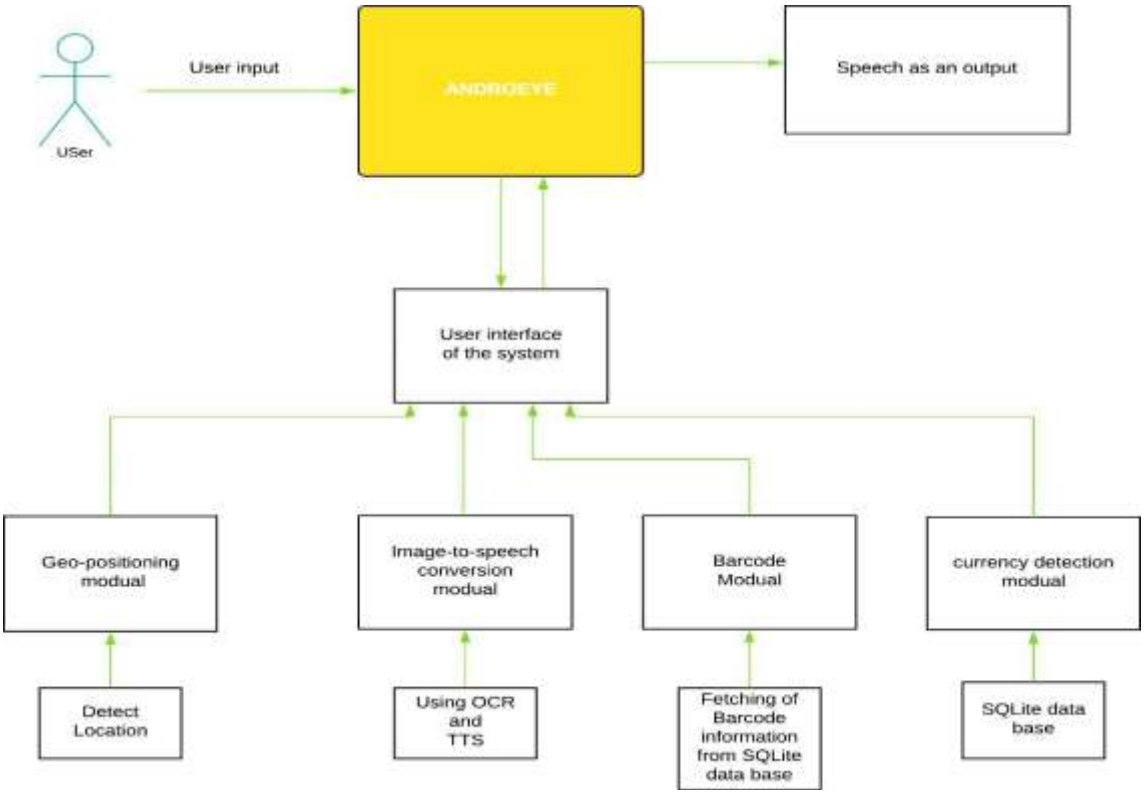

Fig 4. Proposed System

1.1 Image –to –speech conversion module:

4.1.1 OCR ENGINE:

The extraction of the text in the image is done using optical character recognition (OCR). OCR is a field of research in pattern recognition, artificial intelligence and computer vision. It is the conversion of the images of typed, handwritten or printed text into a digital text or computer format text. Earlier OCR versions had to be trained in each character of a text with its specific font. Today, advanced OCRs are available that have a high degree of accuracy, support a wide variety of image formats, languages and fonts. For our project, we have used Tesseract OCR. It is the most accurate open source OCR engine and is powered by google. It can be used on the Linux, mac and windows platform. The newest Tesseract version, 3.4 supports a hundred languages. However, images must undergo a number of pre-processing stages like noise removal, scaling etc. otherwise the output will be of low quality. [1]

4.1.2 TTS SOFTWARE:

The process of converting text to speech by a computer is called speech synthesis. A text to speech system (TTS) is used to perform speech synthesis. A TTS is composed of two parts: front end and back end. The front end converts the text to a symbol, for example, a number. Each symbol generated is assigned a phonetic. The back end then converts the phonetic into sound. In our project, we have used Festival TTS. Festival is the most

widely used open source TTS. It has a wide variety of voices and support English, Spanish and welsh language. We have used the English language. [1]

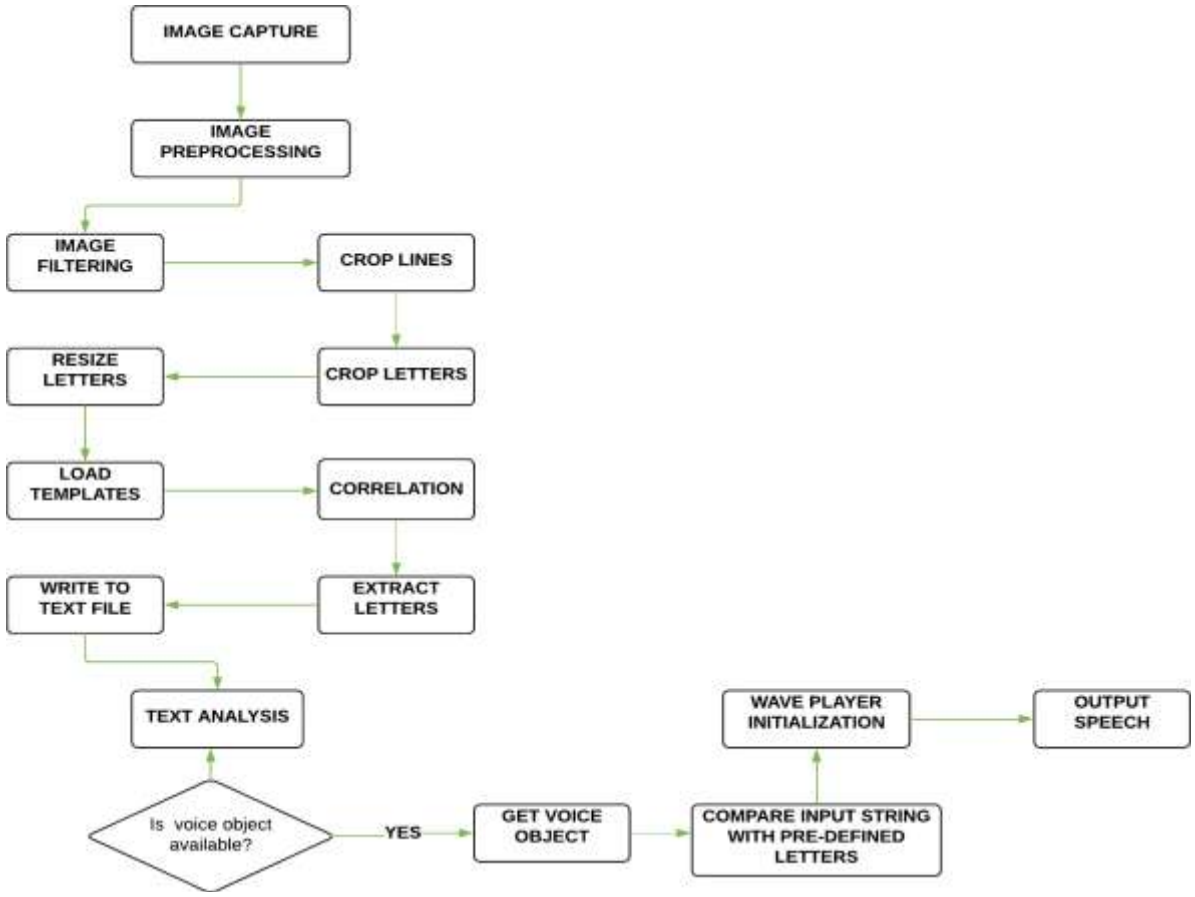

Fig 4.1 Flow Diagram

1.2 Geo-positioning module:

The Geo position system is introduced in many applications integrating navigation-assistance system for blind and visually impaired people. A new way of guidance has been developed by using the smartphone's in this application it's a person its position according to longitude and latitude. Also its address including pin code is given. Geo-position module is helpful only to locate a person's exact location for emergencies. [3]

1.3 Currency Detection Module:

Intended to help the visually impaired to identify the various currency denominations, differentiate them with ease and keep them conveniently for easy access. This application would use the camera module to recognize the currency and inform the user with an audio or vibratory output as desired by the user. A smart wallet is also being designed to reduce the need to use the application repeatedly while giving currency. This we believe would empower the visually impaired and instill confidence when they go through monetary transactions.

We intend to make an Android application with very simple user interface supported by audio feedback that would help the user to adjust camera; the application would automatically click a picture as soon as it detects all the edges in camera preview. Using image processing (color detection, size estimation and pattern recognition) and OCR the audio output would be given. The application would include some other utility features like 'Counting Mode' to help user know the total sum in his/her hands by detected them one by one using mobile. The smart wallet is an additional support to the users to keep their money in a better organized manner and avoid situations like giving away a currency note of higher denomination due to confusion in storing. [3]

1.4 Barcode module:

The Barcode module is generated to provide barcode usage which can use scanner to read the information given in barcode. It increases security and privacy of information given in barcode. 1D Barcode can also be generated using this module. [4]

2. Hardware and software use

5.1 HARDWARE: Smartphones.

5.2 SOFTWARE: Tesseract, Android Studio, Firebase.

V. Conclusion

This is an approach for image to speech conversion using optical character recognition and text to speech technology. The application developed is user friendly for users, cost effective and applicable in the real time. People with poor vision or visual dyslexia or totally blindness can use this application for reading the documents and books. Future scope of this project are handwriting detection, regional language support, locations of nearby places, foreign currency detection. People with speech loss or totally dumb person can utilize this application to turn typed words into vocalization.

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