Blind Vision: Text Reader For Visually Impaired People

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Abstract—Life of blind people is very challenging. Visually impaired people report numerous difficulties. Some of the problems faced by blind people are accessing printed text , problems related to alignment, focus, accuracy and mobility. These people need their friend or family members help to navigate them in the unknown environments. The main aim of this system is to build an automatic text reading assistant using existing hardware associated with innovative method. A personal digital assistant (PDA) is used because it combines small-size, computational resources. Three key technologies are necessary for this Are : text detection, optical character recognition and speech synthesis. Moreover, specific interface is also used to answer a blind people request. In this paper, we report on the findings of a large-scale study of the visual questions that blind people would like to answer. The recognized text codes are output to blind users in speech. Performance of the proposed text localization algorithm is quantitatively evaluated on ICDAR-2003 and ICDAR-2011 Robust Reading Datasets. This algorithm achieves the efficiency to improve the text reading for blind people.

Keywords - Blind Vision, Impaired People.

I. INTRODUCTION

Of the 37 million people across the globe who are blind, over 15 million are from India. What's worse, 75% of cases are of avoidable blindness, we thanks to the country's acute shortage of help and donated eyes for the treatment of corneal blindness. Many problems face when trying to carry out routine daily activities when your older relative experiences vision loss. There are, however, many easy solutions to these problems which can ameliorate the impact of vision loss

Environmental-

People when blindness or low vision often have a difficult time self-navigating outside well-known environments. In fact, physical movement is one of the biggest challenges for blind people, explains World Access for the Blind. Traveling or simply walking down a crowded street may pose great difficulty. Because of this, many people with low vision will bring a sighted friend or family member to help navigate unknown environments. As well, blind people must learn every detail about the home environment. Large obstacles such as tables and chairs must remain in one location to prevent injury. If a blind person lives with others, each member of the household must diligently keep walkways clear and all items in designated locations.

Technology-

Technology poses a challenge for blind people as well. For example, a blind person cannot read the information on a web page. Searching the internet requires screen reading software will read the information on a website, but this may require a significant amount of time to learn the process. People who have limited vision may have difficulty with viewing websites as well, particularly the small fonts, icons and screen colors used by many sites, says the University of Wisconsin. People with low vision may require special equipment that can enlarge a screen significantly. Other technology, such as music players that require visual selection of music, or text messages, will also cause challenges for blind people.

II. RELATED RESEARCH WORK

Giving Visually Impaired people the ability to read printed text has been a topic of keen interest in academia and industry for the better part of the last century. The earliest attainable evidence of an assistive text-reading device for the blind is the Optophone from 1914 [1], however the more notable effort from the mid-20th century is the Optacon [2], a steerable miniature camera that controls a tactile display.

Working

Text detection: There is problem of automatically finding the text areas in images taken by a digital camera. The difference between text, figures or background is obvious to a human reader. It is, however, complex to formalize for an automatic system. Actually, camera-captured images present a bunch of degradations, missing in scanner-based ones' such as blur, perspective distortion, uneven lighting, moving objects or sensor noise. For avoiding above kind of distortion they classified text detection in edge, color or texture based.

Edge detection: They are based on the basic idea that the edges of text symbols are typically stronger than those of noise or Edge-based techniques use edges information in order to characterize background areas. Gradient energy

must be firstly highlighted. Filters such as Sobel or Canny detectors are commonly used to emphasize gradient information. These methods operate essentially in grayscale format and do not require much processing time.

Color detection: The use of color information allows segmenting the image into connected components of uniform color. A reduction of the color palette is necessary in order to keep a reasonable number of candidate layers. The remaining candidates must be reduced by using various properties of the image. The main drawbacks of this approach consist of the high color processing time and the high sensibility to uneven lighting and sensor noise. The advantages of this system are converting printed text into audio and any document can be read by Visually Impaired people. The disadvantages of this system are, entire document is read, this process is not in real time and is difficult to use because Visually Impaired people face so many problems while taking photo of text documents.

III. EXISTING SYSTEM

Braille Translators

Braille-translation software (or embedded hardware) converts ink print into Braille or Braille into ink print. Ink print means text prepared for reading by the eye, whether actually printed, displayed on a screen, or stored in a computer. Braille means text prepared for reading by the finger, whether actually brailed, displayed on an electronic Braille device, or stored in a computer. Braille-translation software is usually classified as Assistive Technology, since the action of the software provides Braille for a blind person. Braille translators can be run by persons with or without sight. A Braille translator can run on a personal computer, on a network server, or (historically) on larger mini-computers or mainframes of larger institutions. Some languages use unconstructed Braille, where each letter uses a specific Braille character. Unconstructed Braille requires manipulation of capitalization, emphasis, numbers, and punctuation. Some languages use contracted Braille, where the rules for various contractions (Braille abbreviations) are quite complex.
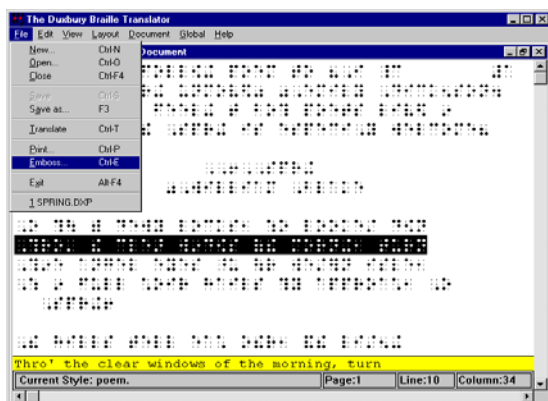
Fig: Braille Translator

In the paper, we propose a camera-based assistive system for visually impaired or blind persons to read text from signage and objects that are held in the hand. The system is able to read text from complex backgrounds and then communicate this information aurally. To localize text regions in images with complex backgrounds, we design a novel text localization algorithm by learning gradient features of stroke orientations and distributions of edge pixels in an Adaboost model. Text characters in the localized regions are recognized by off the-shelf optical character recognition (OCR) software and transformed into speech outputs. The performance of the proposed system is evaluated on ICDAR 2003 Robust Reading Dataset. Experimental results demonstrate that our algorithm outperforms previous algorithms on some measures. Our prototype system was further evaluated on a dataset collected by 10 blind persons, with the system effectively reading text from complex backgrounds. Keywords: blind person; assistive text reading; text region; stroke orientation.

Classic text to speech engine

Visually impaired persons usually have a hard time navigating their phone. Whether it's reading a book or texting someone, they are limited on the things they can do. However, SVOX Mobile Voices made an application that will eliminate the problems of most visually impaired people with the use of the Classic Text to Speech Engine application. The Classic Text to Speech Engine app is a combination of over 40 male and female voices that supports people by reading out aloud their texts, e-books, translations, and even navigation. The app features voice support in key areas like navigation, as it will keep you guided when you are driving. It also reads aloud your favorite e-book or PDF documents, making it an eye-free application. Not only that, it also helps users with their pronunciation. This classic application installs a TTS engine, making it compatible with other applications, as well. The classic text to speech engine is illustrated below in figure 2.4. The advantages are it helps Visually Impaired people in message converting into audio format.
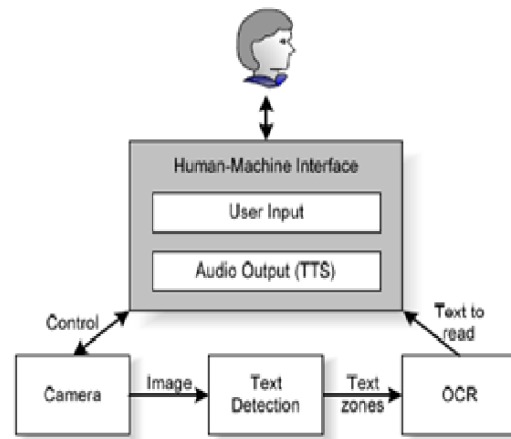
Fig:Classic text to speech engine

Talkback

Talkback is an Accessibility Service that helps blind and Vision Impaired users to interact with their devices. Talkback adds spoken, audible, and vibration feedback to your device. It is a system application that was pre-installed on most devices and is updated when the accessibility service is improved. In a nutshell, Talkback will greatly help blind people hear what they are trying to do with their mobile phone as the app will tell them the item that they have just selected or picked. The app can also read texts aloud and every movement the user makes on her or his phone is carefully being monitored and spoken by the app .The figure illustrated below gives us an overview of the Talkback application and what kind of settings is required to make the application fully functional. The advantages of Talk Back are ,it helps blind people for using smart phones also provides vibrating or audio feedback Here are the most frequently occurring circumstances.

IV.   PROPOSED PLAN

Optical Character Recognition, or OCR, is a technology that enables you to convert different types of documents, such as scanned paper documents, PDF files or images captured by a digital camera into editable and searchable data.

What Technology lies behind OCR

The exact mechanisms that allow humans to recognize objects are yet to be understood, but the three basic principles are already well known by scientists – integrity, purposefulness and adaptability (IPA). These principles constitute the core of ABBYY Fine Reader OCR allowing it to replicate natural or human-like recognition.

Let's take a look on how Fine Reader OCR recognizes text. First, the program analyzes the structure of document image. It divides the page into elements such as blocks of texts, tables, images, etc. The lines are divided into words and then - into characters. Once the characters have been singled out, the program compares them with a set of pattern images. It advances numerous hypotheses about what this character is. Basing on these hypotheses the program analyzes different variants of breaking of lines into words and words into characters. After processing huge number of such probabilistic hypotheses, the program finally takes the decision, presenting you the recoganized text..

In addition, ABBYY Fine Reader provides dictionary support for 48 languages. This enables secondary analysis of the text elements on word level. With dictionary support, the program ensures even more accurate analysis and recognition of documents and simplifies further verification of recognition results.

What Principles is Fine Reader OCR Based On? The most advanced optical character recognition systems, such as ABBYY Fine Reader OCR, are focused on replicating natural or "animal like" recognition. In the heart of these systems lie three fundamental principles: Integrity, Purposefulness and Adaptability. The principle of integrity says that the observed object must

always be considered as a "whole" consisting of many interrelated parts. The principle of purposefulness supposes that any interpretation of data must always serve some

purpose. And the principle of adaptability means that the program must be capable of self-learning.

One does not have to be an OCR specialist to see the advantages of an OCR application built on the IPA principles. These principles endow the program with maximum flexibility and intelligence, bringing it as close as possible to human recognition. After years of research, ABBYY was able to implement the IPA principles described above in its OCR technologies.

Recognition of Digital Camera Images

Images captured by a digital camera differ from scanned documents or image-only PDFs. They often have defects such as distortion at the edges and dimmed light, making it difficult for most OCR applications, to correctly recognize the text. The latest version of ABBYY Fine Reader supports adaptive recognition technology specifically designed for processing camera images. It offers a range of features to improve the quality of such images, providing you with the ability to fully use the capabilities of your digital devices.

Text to speech

Visually impaired persons usually have a hard time navigating their phone. The text to speech is available in windows. Whether it's reading a book or texting someone, they are limited on the things they can do. However, SVOX Mobile Voices made an application that will eliminate the problems of most visually impaired people with the use of the Classic Text to Speech Engine application. The Classic Text to Speech Engine app is a combination of over 40 male and female voices that supports people by reading out aloud their texts, e-books, translations, and even navigation. The app features voice support in key areas like navigation, as it will keep you guided when you are driving. It also reads aloud your favorite e-book or PDF documents, making it an eye-free application. Not only that, it also helps users with their pronunciation. This classic application installs a TTS engine, making it compatible with other applications, as well. The classic text to.

Camera

The camera is use to capture the text we take text as an input to our system. For the input bases technology we were using web cam to capture the text.

V. SUMMARY

In this paper we proposed a web camera based system which convert by OCR(optical character recognition).In

OCR technique firstly capture a image from image and the OCR is extract text from image then it transfer text into a speech. which is help to blind and visually impaired people easy to understand normal text which is capture by camera. with the help of with this blind people can easily read a normal text without using a Braille to finger reader scanner.

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