(REVIEW ARTICLE)

Image based product recognition using barcode and OCR for visually impaired people

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Abstract

Humans do require a lot of communication. When there is interaction between normal people and blind people, communication can be difficult at certain points. This program facilitates communication between blind persons and the rest of the world. Numerous programs are available in the marketplace to help blind people interact with the outside world. To reach the blind, voice mail and chat programs are available. This program allows a person who is blind or has a visual impairment to purchase a product at a supermarket or grocery store using a scanner to scan the barcode of the product. It helps blind people get information on packaged foods and their descriptions. To use this system, you only need to take a photo of the object.

Keywords: Product Scanning; Barcode Recognition; Text Recognition; Optical Character Reading

1. Introduction

With advances in new technologies, mobile devices have grown in popularity to become one among the foremost common consumer devices. Cell phones are an awfully important part of modern life. Many people must make a call or send a message anytime from anywhere. For blind and motion-impaired people this issue is more obvious, but others also often face this problem, e.g., when driving or employing a smart-phone under bright sunshine. This is an android application which supports voice commands. The blind people face challenges daily in communicating with the globe around them. they need to depend on their sighted colleagues for creating a phone call and accessing other mobile functionalities. This application helps the user to shop for products on their own by scanning the barcode of the merchandise so it retrieves the merchandise details and converts them into a speech output.

1.1. Related works

1.1.1. An Efficient Bar/QR Code Recognition System for Consumer Service Applications

Arjun Aman, Aryan Singh, Ayush Raj and Sandeep Raj (2020 IEEE)

The method automatically detects the QR barcode and shows full product information. The method is built within a python environment using the OpenCV library. However, OpenCV has no dedicated modules that can be used to read and decrypt bar codes and QR codes. The database is developed at the Institute of Authors, where bar codes and QR codes are assigned separately to over 100 items such as books, couches, tables and chairs

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1.1.2. Research on Text Detection and Recognition Based on OCR Recognition Technology

Yuming He (2020, IEEE)

This article talks about optical character recognition (OCR) being a very important branch in machine vision. It involves form recognition, picture processing, digital signal processing, artificial intelligence and other disciplines. It is important to use value and theoretical meaning in high-tech areas like word science, office automation, AI and real-time surveillance systems. In the past, text detection and recognition algorithms were mostly supported by artificially designed features and traditional image processing methods.These features and algorithms were difficult to put into shape and required a lot of professional knowledge and support skills, so the accuracy was not high and not generalized

2. Proposed method

The proposed system is designed in such a way that it gives the product details using barcode. Barcode reader and text recognition is used to recognise the barcode and give details like manufacture and expiry data ,text recognition is used to fetch the ingredients used in that product. OCR algorithm is used to capture the image and extract the details from that image.

2.1. Proposed Workflow

The system is divided into modules. The overview of the system consist of barcode recognition and text detection.
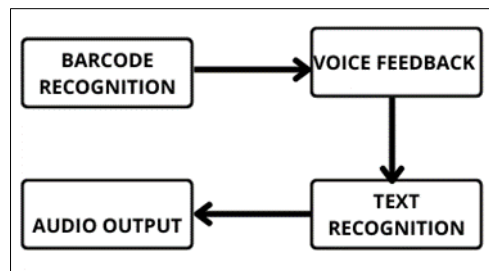
Figure 1 Modules

2.1.1. Barcode recognition

The blind person often refuses to buy products on their own as they cannot see the product details and its description, but using this application the user can scan the product's barcode. The details like manufacture date, expiry date is fetched from the scanned barcode.

2.1.2. Voice feedback

Android provides text to speech library which converts text into a speech.The details extracted from the previous module are converted into voice output as the user cannot view the details.

2.1.3. Text recognition

To get the details like ingredients the user has to capture the image of the product. using OCR algorithm this application extracts the text from the image. to get this they have to click on a button so that it opens the camera to capture the image.

2.1.4. Audio output

The extracted text from the previous module is then converted to an audio output so it will be convenient for the user to purchase the required products.

2.2. System architecture

The user is shown the homepage of the application where a scanner screen is given. The user needs to scan the barcode of the packaged products, the specific product description is recovered and converted as audio feedback Then the user can capture the image of the product packet using Optical Character Recognition(OCR) Algorithm the text from the image is extracted and ingredients in the products are given as audio feedback.
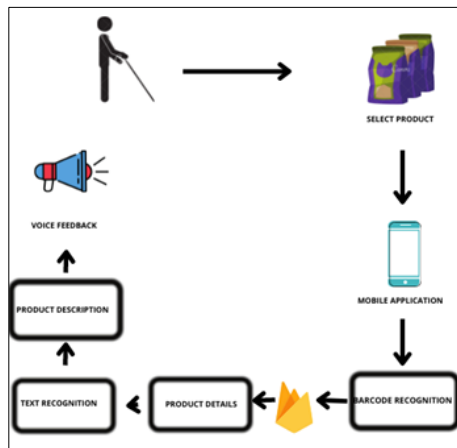
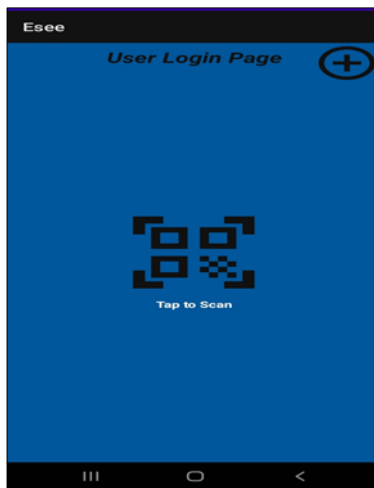**Figure 2** Architecture

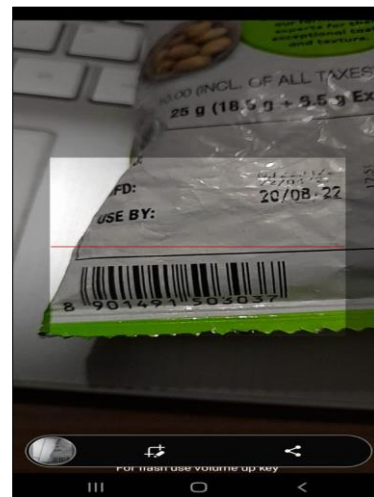## 3. Experimental results

Figure 3 Tap to scan

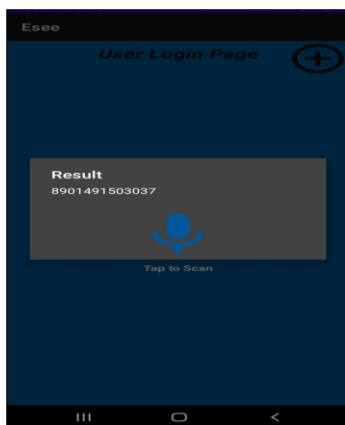**Figure 4** Scanner page
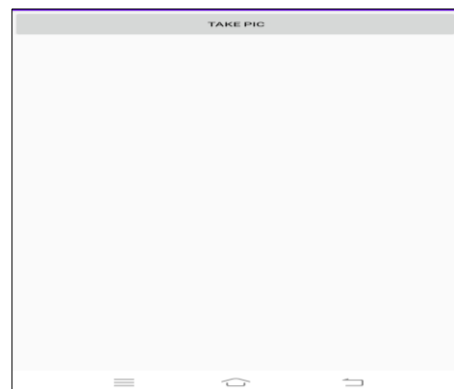

Figure 5 Voice feedback
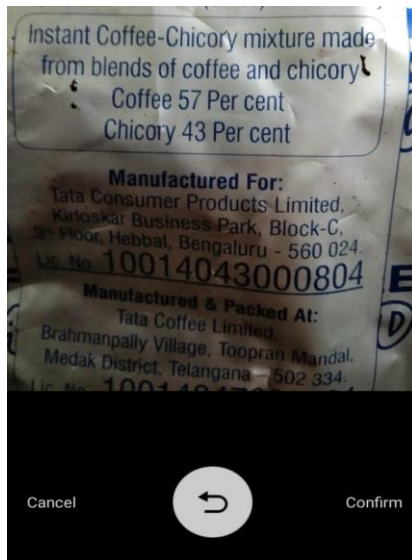

Figure 6 Button to capture image
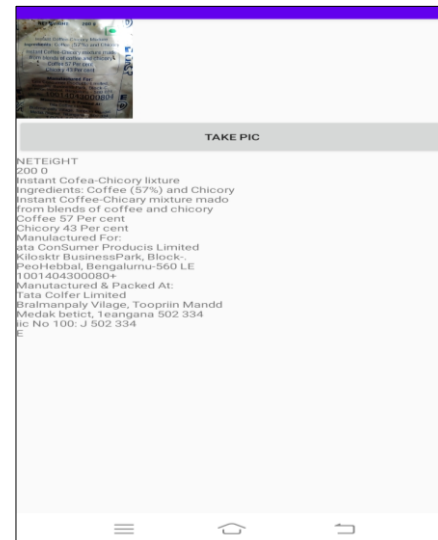
Figure 7 Confirm image

Figure 8 Text and audio output

4. Conclusion

This system makes it simple for the folks to ease the elaborated information of varied products obtainable within the market and also regarding the products that are presently obtainable within the market. This app is extremely effective and useful to visually impaired people. It overcomes hesitancy and gives confidence to purchase their appearance. This application helps people with sight loss to savour their expertise and buy the product they want to buy. Thus, the proposed application greatly assists people with a visual impairment, especially those who are partially blind, by providing an easy way to access everything without anyone's assistance. Hopefully the difficulties they face will be greatly minimised by much more similar and larger applications and concepts in the future.

Future enhancement

The future work of this application is to detect text from any given language. This application helps many visually impaired people to live independently and meet their own requirements. The product recognition application can detect all languages in future however text to speech engines for many languages are not available. It will be easier when it gives more precise results for all products with different languages with no restrictions.

Compliance with ethical standards

Disclosure of conflict of interest

All authors declare that there is no conflict of interest.

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