Effective Shopping Method for Visually Impaired People using Optical Character Recognition

S.Meera, R. Sharmikha Sree, K .Valarmathi

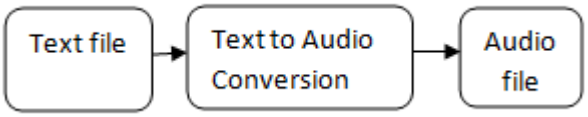
AbstractVisual impairment persons are not able to do all works as normal persons especially during purchasing products in supermarket. To help the blind peoples recognise the objects a text reading method is proposed along with the help of camera. A motion detection method is used to detect the presence of the object. The audio instructions about all the objects and their location in supermarket are notified to the blind user that helps them to move freely inside the supermarket. The proposed system aims to make more convenient for the blind persons to purchase in a sophisticated environment. This system also provides easy shopping, consumers time is saved, etc. The implementation of proposed system is done using artificial intelligence and OCR technology.

General Terms Visually impaired people, smart shopping, OCR.

Keywords Character recognition, Low power, Raspberry Pi 3, Speech Output, Python Programming.

I. INTRODUCTION

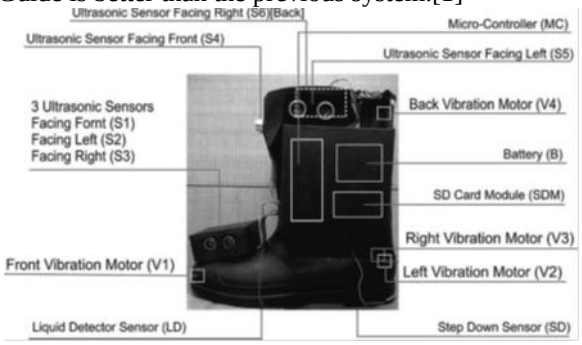
Using this system blind peoples can move freely in store without the help of other persons, this can be implemented by reading the product details. The success rate of this system is 90% on the test set based on the size of the text in the products and distance from the camera. The proposed technique is to read the text, convert it into machine encoded text and then create a text file and that will be processed with the help of digital image analyzing method which is used to read the text as input and audio as output. The main aim is to improve the convenience of visually challenged people by providing them the information through speech signal.



A GPIO header is used and placed on top of the board. Any of the GPIO pins can be used as an input or output pin.

II. LITERATURE SURVEY

In this paper, NavGuide is used, which helps to assist the blind people for finding the obstacle free path. This system provides information about the environment and also the product. User receives the product information through vibration. This system is evaluated in a controlled manner and tested with the real-world environment using NavGuide. The evaluation results showed that performance of NavGuide is better than the previous system.[1]



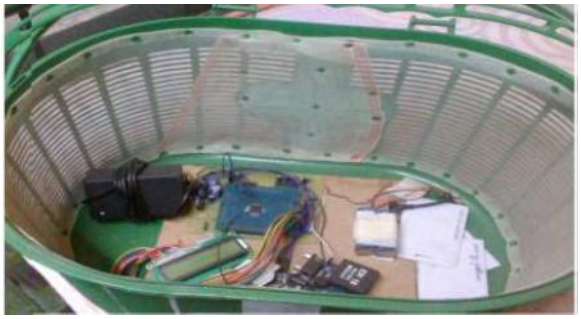
In this paper, NAVI using RGB-D sensor is used which guide blind peoples by using audio signal. This system uses NAVI and it is based on visual information. A consumer RGB-D camera is used which takes the impact of range information and visual data. The major factors needed are depth information and image intensities. [2]

In this paper, the obstacles are identified using electronic travel aids; it also helps by providing other services and also used to get information from the surroundings. In this system, a user gets the data's about the obstacles in the current environment using haptic device. A prototype has a short cane, active handle and sensing method. [3]

In this paper, trolley is used which will be easy for the blind persons to move easily in the supermarket. Trolley uses RFID technique. This RFID technique is very helpful when compared to barcode system. Using the RFID reader the tag can be read at a distance of 300 feet, while using barcode tag can be read at a distance of 15 feet only. Using RFID, reading frequency will be 40 tags at a time [4].

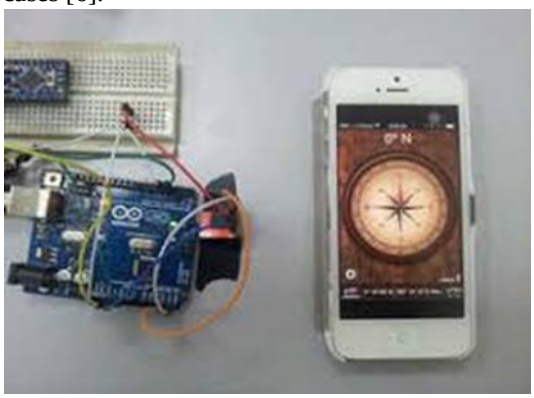
Revised Manuscript Received on 01 October, 2019.

S.Meera, Department of Computer Science and Engineering, Sri Sairam Engineering College, Chennai, Tamilnadu, India.
(Email: meera.cse@sairam.edu.in)
R. Sharmikha Sree, Department of Computer Science and Engineering, Sri Sairam Engineering College, Chennai, Tamilnadu, India.
(Email: sharmikhasree.cse@sairam.edu.in)
Dr . K .Valarmathi, Department of M.E.(CSE), Pannimalar Engineering College, Chennai, Tamilnadu, India.
(Email: valarmathi_1970@yahoo.co.in)



In this paper, the wearable navigation systems are implemented to help the blind peoples for moving in all environments. Three main categories of this system are electronic travel aids (ETAs), electronic orientation aids (EOAs), and position locator devices (PLDs). This system gives a detailed survey about the obstacle detection in any environment and also avoidance of the obstacles [5].

In this paper, the obstacles are detected using electronic mobility cane (EMC). This system also constructs the logical layout of the surrounding environment. Intuitive vibration is used to get the information about the priority of the obstacles. This system is also helpful detecting obstacles in staircases [6].



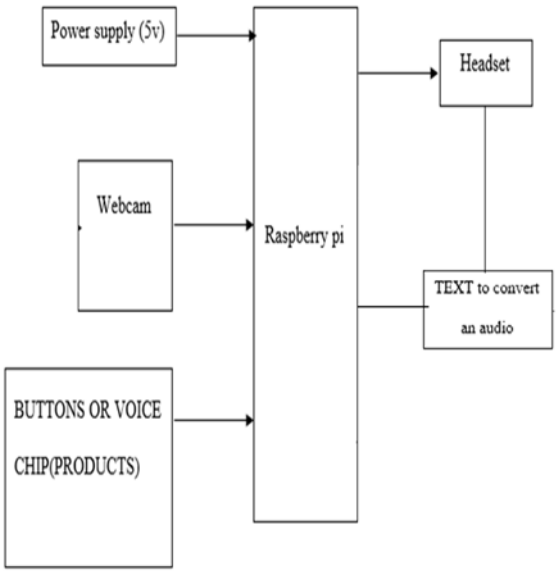
In this paper, the image or text is converted to machine text using the Raspberry Pi. The images and text read are converted into speech. The speech is helpful for the blind peoples to understand their environment [7].

III. SYSTEM ARCHITECTURE

The system design includes following major modules:

(a) Trolley movement
(b)Text Recognition

The Trolley movement in mainly by L293D driver which is connected with Raspberry pi. It acts as a current amplifier which is used to drive the trolley based on inputs. The input logic is 00 or 11, the trolley stopped. The input logic is 01 or 10 the trolley moves in forward or backward direction. In text, recognition text is recognized by character recognition method. This method converts the scanned image into text. This text is then converted to speech[7].



IV. EVALUATION OF SYSTEM& RESULTS

4.1 Advantages

The L293D driver is used to move trolley in all directions. The system is low cost. It is used to get the text information from objects.

4.2 Disadvantages

In L293D driver chip, there is 1.5v or more voltage drop. Handwritten documents and images in dark are not easily recognized by OCR.

4.3 Applications

This idea is mainly used in shopping, banking healthcare, government agencies where text extraction is needed without assistance.

V. CONCLUSION

Thus the system provides smart shopping for visually challenged people without other assistance using L293D driver, Raspberry pi and Optical character recognition technology. It facilitates the visually challenged people shopping. It saves a customer time promotes business sales. L293D driver helps in movement of trolley based on inputs. The text from hand-held object is extracted using an text reading method along with camera. Text Localization algorithm is used to localize the text in region of interest. Text in localize regions are recognized and converted to binary by text recognition algorithm. Using text-to-speech function, the audio is received as output for the recognized text.

VI. FUTURE ENHANCEMENTS

In future the project in enhanced by scene detection implemented in deep learning method. It scans the images in dark background. To save the time of customer, automatic billing can be implemented in trolley itself. The total billing amount is also convert to audio and sends to earphones of visually challenged people. Optical character recognition will develop for recognizing multiple font style in use. It could be developed for converting a language.

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