

A VOICE BASED PRODUCT IDENTIFICATION FOR BLIND PERSONS

N. THEJASWY¹, D. BALAKRISHNA REDDY²

¹N.Thejaswy, M.Tech, Dept of ECE, Madanapalle Institute of Technology and Science (MITS) Madanapalle A.P, India.

²D.Balakrishna Reddy, Assistant Professor, Dept of ECE, Madanapalle Institute of technology and science (MITS), Madanapalle, A.P, India

Abstract: *The project aims at introducing a voice based message for blind persons through an android mobile regarding the product which is captured by a camera. Android provides portability in day today life. It provides multiple advantages in an easy way. To build rich applications android provides wide range of useful tools and libraries. The initial function of the system is to capture the product through a camera. And the captured image is given to the matlab for image processing. In matlab the image will be detected. After recognizing particular data, it is given to the micro controller LPC2148 which is interfaced with LCD display and Bluetooth module. The information obtained from the matlab is given to the Bluetooth module through a microcontroller and is transferred to a Bluetooth inbuilt android mobile. The corresponding information or application related to the tag is opened in the android mobile. The image and the text related to that thing are displayed in the mobile and also voice announcement of the same text will be announced from the android mobile. So that the user can know information regarding that particular object by connecting earphones in android mobile.*

Key words: *Android, Micro controller LPC2148, Matlab, Bluetooth*

I. INTRODUCTION

Reading is obviously very essential in today's life.

Printed text is everywhere in the form of reports, bank statements, products, class room handouts, bills, receipts, instructions on medicine bottles etc., Normal people can easily read these printed text, but it's a very difficult task for the blind persons to read them. The more you read more comfortable you feel. There exist a few systems like portable bar code readers for blind persons that have some importance for portable use. But a big drawback is that it is very hard for blind people to find the position of the bar code and to point the bar code reader at the bar code correctly. Pen scanners may be used in these situations, but these systems perform best with standard fonts and simple back grounds and small range of font size. Hence for this reason, a system for visually impaired to identify the hand held objects or a product with voice announcement is designed.

II. DESIGN AND IMPLEMENTATION

Here we design and develop a system to find products or objects with voice announcements. This system is more advantageous for the blind persons who live independently. In this paper we have been used an ARM7 micro controller board which is interfaced with Bluetooth module and LCD display, web cam, mini laptop and an android mobile.

In this project the product which is to be read is captured by the web cam and is given to the laptop or PC, where the image processing is done in the matlab. The output is given to the microcontroller

board. And is interfaced to android mobile through a Bluetooth module.

III. BLOCK DIAGRAM

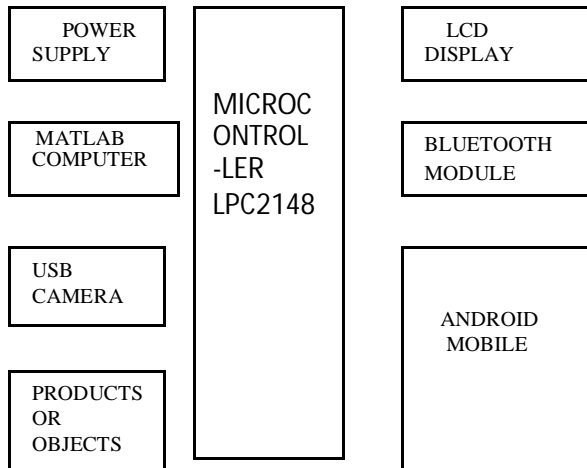


Fig 1: Design of a system

The above shown figure is the main block diagram of the paper. In this block diagram ARM7 is used. Micro controller board is attached with a Bluetooth module, power supply and LCD display

IV. HARDWARE TOOLS

Figure 2 shows the ARM7 micro controller board which is interfaced with bluetooth module, power supply, and LCD display.

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Fig 2: Micro controller board

Figure 3 shows the web cam which is used to capture the image of particular product which has to be detected. Below figure shows the webcam which is used in the project.



Fig 3: Web cam

Figure 4 shows the Bluetooth module that is interfaced in the microcontroller board. Here the Bluetooth module used in the project is ESMTECH.

Bluetooth is one of the wireless technologies which is used to transfer data between various electronic devices. Comparing to other modes of wireless communication Bluetooth has less distance of data transmission. This technology enables the electronic devices to communicate wirelessly without the use of cables, cords, adapters.

Bluetooth device usually comprises of an adapter. To integrate into the electronic device or to connect the device, a Bluetooth adapter is available in the form of card. The Bluetooth RF transceiver is positioned at the physical layer.



Fig 4: Bluetooth Module

Figure 5 shows the LCD display interfaced to the microcontroller. LCD used in this project is of 2*16 line LCD display. Here LCD displays the product name which is identified by the camera.



Fig 5: LCD display

Figure 6 shows the android mobile which has an application named museum ESMTECH. This application has an inbuilt Bluetooth and receives the data required through the Bluetooth module which is interfaced to microcontroller.



Fig 6: Android mobile

V. Framework Overview:

This particular paper presents the prototype of product identification. The project frame work consists of some functional components like: scene capture through portable camera, data processing in mat lab and audio output from the android phone. The portable camera captures the particular object in the form of image.

Data processing is performed for deploying the algorithm like 1. To detect the object of interest from the neutral products and litter back ground in the view of camera; and 2. To get the image pixels to the matlab.

Mini laptop is used in the particular prototype system. The output from the matlab is given to the micro controller which is attached with a Bluetooth module. And the audio output is produced from the android phone which is interfaced to the microcontroller board through Bluetooth.

VI. System Design

This paper proposes a prototype system of product identification. System design mainly consists of three functional components,

- [1] Scene capture
- [2] Data processing and
- [3] Audio output.

Scene capture component collects the image which consists of object of interest, in our project it corresponds to the webcam which is interfaced to the laptop through an USB.

Laptop is used as a processing device in our current prototype system which has a matlab code where the image processing is performed. The audio output component is used to inform the blind user of recognized text codes obtained from the processing. In this paper android mobile is used as an audio output component which has a Bluetooth interfaced application called Museum ESMTECH.

Here the objects which are to be detected are trained in matlab initially. We can train many number of objects which are to be identified by the impaired user. Then, whenever the users capture the product which is trained in the matlab, it is sent to the microcontroller which is interfaced with the Bluetooth module. When the application

in the android mobile is turned on, the information regarding that captured product is obtained through a voice output.



Fig 7: Hardware Implementation of the Project.

VII. RESULT



Fig 8: Output on the LCD

The same tag related to the captured product is produced on the android mobile also.



Fig 9: Project Design

VIII. CONCLUSION

In this paper, we have described a prototype system to detect the hand-held objects for assisting blind persons. This proposed paper gives better output when compared to the other papers which are discussed in the references. It is better in some features like capturing images from the cluttered background, hearing audio output through an android phone using Bluetooth technology.

IX. FUTURE SCOPE

Future work may include some innovations like, preventing accidents and avoiding obstacles when moving alone. By using ultrasonic technology alarm can be implemented for avoiding accidents. In future these implementations may be very useful for the visually impaired persons to live independently.

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