Mobile Application for Visually challenged

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I.Abstract

Normally, visually challenged people require some physical assistance to lead a normal life as of others. They cannot use smart mobile which is in the position to offer many helps that are required by the visually challenged people. Visual impairment may cause people difficulties with normal daily activities such as driving ,reading ,socializing and walking. This mobile application facilitates the visually challenged people to lead a common life without getting any physical assistance. So that they do not need to seek help from others as everytime. And this application will guide them through the voice and it has the modules that can get rid of their frequent problems. It resolves the inability of that people to see the objects. It involves video calling module, that lets the nearby available normal people to get connected to the visually challenged people and guide them through the video call. It also involves voice enabled menus that facilitates user to toggle among pages. Other essential modules like emergency calling, object Identification and detection of nearby buses. And next is emergency calling, through which they can call and communicate with their friends if they are in need of any help. In object identification module, if visually challenged people places any object in front of the camera then audio note will say that what is that object. And the last one is bus detection module, which will say what are all the nearby buses that will cross the people. Here, Radio Frequency Identification(RFID) tag will be used to detect the bus that the people is looking for.

II.INTRODUCTION

Visual impairment is the hardest feel ever felt by the people. Due to this they cannot lead a normal life as that of normal people. In general, visually challenged people are more sensitive to sounds, vibration and ability to fell the sensation through feel. Thus we provide this mobile application as an interface, that facilitates the visually impaired to use the app as others do. It is achieved through voice enabled guidance that differs with single click and long click of the content in the menu.

III.OTHER RELATED WORKS

Image recognition for visually impaired people by sound.

Be My Eye - Be My Eyes is an app made up of a global community that connects people who are blind or have low vision with sighted volunteers. Volunteers assist users through a live video connection and work together to tackle challenges and handle a wide range of tasks. With more than 60,000 blind and low vision users and over 900,000 volunteers, the app harnesses the power of generosity, technology and human connection to help blind and low vision people lead more independent lives. Be My Eyes is available in more than 150 countries worldwide and in over 120 languages. The app is free for both iOS and Android.

LookTell – LookTel Recognizer allows users with visual impairments or blindness to instantly recognize everyday objects such as packaged goods in the pantry, identity cards, soda cans at the grocery store, or CDs in a music collection. Once a library has been built, users can simply point the iPhone's camera at an object and the phone will recognize and describe the item instantly.

Object Detection: Object detection is a computer technology related to Computer vision and image processing that deals with detecting instances of semantic objects of a certain class in digital images and videos. An attempt is made in this study to detect and extract
objects in an image implemented on android platform. Color images are converted to binary images using the thresholding technique. Morphological opening and closing filters are used in sequence for object detection. Contour based learning techniques are adopted for drawing contours of the objects detected. In the process objects are extracted and stored in an array for further analysis. OpenCV functions are used to implement these algorithms on android.

IV.IMPLEMENTATION

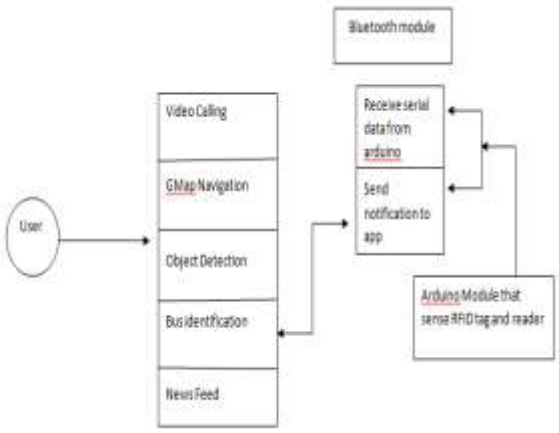

Figure 1

A – Module 1 : Video calling

TokBox is a PaaS (Platform as a Service) company that provides hosted infrastructure, APIs and tools required to deliver enterprise-grade WebRTC capabilities. It does so primarily through its proprietary OpenTok video platform for commercial application.

The Video Chat Embed is the easiest way to quickly add basic OpenTok functionality to your website using an embeddable HTML snippet.

Once implemented on your site, you can click the embed to connect to a "video chat room." Other users can then click on the embed in their own browser and join the same chat room (up to three participants). You can even create separate rooms with the same embed using the room parameter.

Creating a Video Chat Embed

Go to your TokBox Account and **Create a Project** (either from the side menu or your Account Overview.)

Select the **Embed** project option.

Name your embed.

You will use this name later to find the embed in your TokBox Account.

Specify the width and height of the embed.

Specify the website domain where you plan to use the embed.

6.Click the **Create Embed** button.

After completing these steps, your embed code will be generated on the page. Copy this code and save it so you can add it to your website. You can get this code at any time by selecting

an existing video chat embed in your TokBox Account and clicking the **Copy Embed Code** button at the top of the Embed Overview.

Figure 2 - Video Calling screen

B – Module 2 :Bus Detection.

Arduino

Arduino is an open-source electronics platform based on easy-to-use hardware and software. It's intended for anyone making interactive projects.

Arduino senses the environment by receiving inputs from many sensors, and affects its surroundings by controlling lights, motors, and other actuators.

HC-05 Bluetooth module

The Bluetooth module HC-05 is a MASTER/SLAVE module. By default the factory setting is SLAVE. The Role of the module (Master or Slave) can be configured only by AT COMMANDS. The slave modules cannot initiate a connection to another Bluetooth device, but can accept connections.Master module can initiate a connection to other devices.The user can use it simply for a serial port replacement to establish connection between MCU and GPS, PC to your embedded project, etc

C – Module 3 : Object Identification.

Input - Input data matrix, class information
Output - Set of Basis vectors Begin Repeat

Support Vector Machine (SVM) is a machine learning tool that is based on the idea of large margin data classification.
The tool has strong theoretical foundation and the classification algorithms based on it give good generalization performance.

- Canny Edge Detection
- Apply Gaussian filter to smooth the image in order to remove the noise
- Find the intensity gradients of the image
- Apply non-maximum suppression to get rid of spurious response to edge detection
- Apply double threshold to determine potential edges
- Track edge by hysteresis: Finalize the detection of edges by suppressing all the other edges that are weak and not connected to strong edges.

Figure 3 - Identification of Orange

Figure 4 Identification of Strawberry

D – Module 4 : Emergency Calling

This module allows emergency calling to predefined 3 numbers via the application itself. This menu will also be voice enabled.

Figure 5 - Emergency Calling

E – Module 5 : Google Map Navigation

This module provides voice enabled google map navigation to a specific area (say, the person's frequently visited area)

Figure 6 Google Map Navigation

F – NewsFeed

This module provides audio enabled news feed, that lets the user to know the current updates about the society.

Figure 7 News Feed

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