Smart Purchasing Bot for Visually Impaired People

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Abstract:

To provide self-determined analysis andfamiliarization to visually impaired people ispopularized an new electronic beneficial appliance called Navcane. This appliance helps people to find obstacle-free paths in both indoor and outdoor framework.Also it aids in the recognition of objects in an indoor setting. The precedence information deduced by the system is impart to the user using tactual and auditory declaration methods.Unlikeextantelectronic travel assistance scheme which are limited to obstacle detection and path finding, the Navcane also helps users by perceive substance in known indoor settings. To test the usefulness of the Navcane, object perception, and rehabilitation for visually impaired people, we assessed it with the help of 120 visually impaired people from a blind school and a home for elderly people. All the assessmentswereaccomplished incontrolledindoorand outdoor test habitat with both a Navcane and a white cane. The preliminary results show thatthewhitecane which gives an alert sound for obstacle detection where asNavcaneisaneffectivedevicefordetecting of obstacles, ascending and descending staircases, navigating wet floors, and object recognition in environments that are known and unknown to the user.It is low cost and as a low power embedded device for obstacle detection and obstacle description.It is andistinctive to appliance visionorganizations.

KeyWords:Navcane,Whitecane,obstacle detection

INTRODUCTION:

Vision is one of the important human senses for gaining knowledge of the surrounding environment. The absence of vision makes unassisted navigation, object identification, and orientation in the unfamiliar settingsisa challenging task. According to a report by the World Health Organization (WHO), 314 million people worldwide suffer from visual impairment. The reason for visual impairment is typically eye disease or uncorrected refractive errors. Out of the 314 million visually impaired people, 45 million peoples were blind. Blindness is an issue that is prevalent and ever increasing due to the aging population. In older people, there is a higher risk of visual impairment that increases the difficulty of autonomous mobility. For many people with visual impairments, assistance plays an important role in social participation.

The absence of applicable assistive mechanism for people with visual impairments makes them too reliant on their family members.To overcome these limitations visually impaired people use whitecanes for detecting the knee obstacles but it will not be suitable for all their needs. Safe and independent mobility is still a challenging task for visually impaired people. Some Electronic Travel Aids (ETAs) have been implied by analyzer to assist visuallyimpairedpeoplewithmobilityandtoincrease their pace whilenavigating.

The distinct forms of extant ETAs are wearable gadgets, smart canes, and handheld appliances. The low approvalpercentage does not mean that visually impaired people resist embracing electronic assistive appliances; instead it indicates that there is a need for further exploration to improve the adaptability and usability of ETAs.

1.RELATEDWORKS:

The essential of the United Nations Convention on the Rights of Persons with Defect (CRPD), user-centered aid are authorized, so that visually impaired people will also be enhance in the design

determination about the support or aid required by them. In[1] it conveys the priority information to the subject by intuitive vibration ,audio or feedback They analyzed that white cane does not provide much needs of them like does not provideinformation about surrounding environment, need to detect scaffoldsandheadlevelobstaclestoavoidinjuries,did not provide knowledge of descending staircases etc., and soon.

The participants preferred using ETAs that are easyto carry and light weight. In [2] intending a haptic interface to reproduce the stimuli provided by traditional whitecane without any contact with the environment.They felt that the assistive device should be cost effective and provide audio feedback to them about obstacles.To overcome this whitecane,Navcane is implemented. It helps users identify indoor objects by using an radio-frequency identification (RFID) reader and RFIDtags.

The depiction of an object allows a vision defect person to accurately and independently move from one position to another. The C-5 laser cane emits infrared pulses that are reflected by objects in front of it and are imitate by object in front of a photodetector. The distance of the obstacle can be calculated based on the angle madeby the reflectedpulse.

The Ultracane was a step forward in assistive appliance. It disclose objects in front of and at shoulderorheadheight oftheuser. In [5] handsfree and wearable device that allows to detect low and high hanging obstacles.Itaudittheuser about disclosed obstacles through tactualappraisal.The Guide cane is a motorized cane that has a flat disk at the framework. The roller is useful during its regular activitybutitaddsaddition gravitytothecane.Itcannot expose overhanging obstacles or side-walk borders. The capabilityby Ando et al and the EMC use tactile and audio notefactor to warn users about obstacles detected in the surrounding habitat. The adornment is limited to detecting only floor-level and knee-level obstacles. Zhang et al proposed robotic navigation aids (RNAs)for the absolute flexibility of vision defect people.

This technology used a threedimensional (3-D) camera for obstacle free indoor way finding for visually impaired people.In[4]assistive artifact maintain or improve an individual functioning and independence there by encouragingtheir well being.hearingaids,communicationaids,memory aids are the examples of assistive artifacts.A global positioning system (GPS) device, a proximity sensor, two small cameras, and a microphone to collect the input from the surrounding environments

Vibrating devices and speech synthesizers are used as output appliance to convey the calculated space to the user. This information is useful to the user to identify objects in front of him. The NavGuide is a wearable device that detects obstacles up to the knee level in the front, left, and right directions. NavGuide is a wearable device, whereas the Navcane can be integrated into existing white cane systems. the NavGuide is limited to obstacle detection only, whereas the Navcane provides both obstacle detection and obstacle identification features.

2. PROBLEM:

The problem faced by the vision defect people by the use ofwhitecane they may not able to expose the obstacles and they did not get the further awareness based on surrounding habitat. They find difficulties to identify upstairs and downstairs to overcome this we are implementing the Navcane which is based on detecting and reading the objects using RFID reader and OCR respectively.

This helps to detect the object and directly it gets connected to the billing section so that bill will be updated automatically this will consume very less amount of time and they will not dependent to human support. The user will mention some specific commodity throughtheheadsetthroughtheUVsensorandrobotic cylinders it will move automatically and stop on the particular site and it will mention the scope all togetherbetweentheuserandtheracksothatthey will not get injured. They will scan the object through the camera and they will mention the name of the project through headphone so that the user can recognize whether the object taken by the user is correct or not isidentified.

3. ModuleDescription:

Module 1: Image Capture and Pre-processing

The image is captured by using web camera and the frames from the image is segregated and undergoneto the pre-processing**.** Object is extracted from the camera image and it is converted into gray image**.** It uses cascadeclassifiertorecognize thecharacterfromthe object by OCR algorithm**.** It stores the text and convert to audio as output**..**This technology used a three- dimensional (3-D) camera for obstacle free indoorway finding. For visually impaired people. It provides audio note to the user to declare the reference points and navigational authorized. An object recognition method for blind people is implemented by Yeetal using a robotic navigation aid. It allows the real-time detection of indoor obstacles.

It is a device used for mobility within premises and is also used to read text. Vibrating devices and speech synthesizers are used as outputdevicestoconveythecalculateddistancetothe user. This intelligence is useful to the user to determine objects in front of them.The voice appliance provides audio assessment to its users about obstacles .It uses machine vision approach to identify theobstacles

Module 2: Automatic Text Extraction

Fig .1Text Extraction

In this fig(1) the extraction of text is performed through RFID reader. The web camera will scan the words or logo present in the product using tesseract algorithm. The tesseract innovation is able to exactlydecipher and it will excerpt the text from any origin.

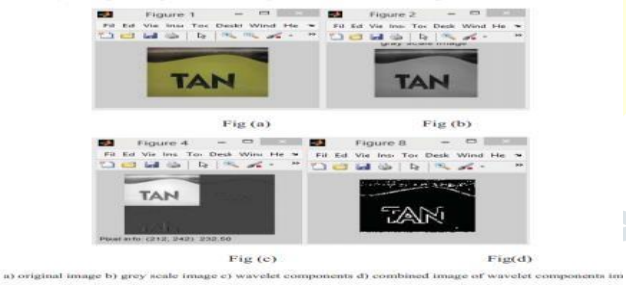

Fig. 1.1 Scanning the name of the product in stroke method

In fig(1.1)denotes the various form of examining the words present in the commodity. In the potrait(a) the original appearance of the product is presented. In potrait(b) the web camera will scan the iconeithercoloredoringrayscalemanner.Inpotrait (c)&(d) The camera will scan only the words or logo initandremainingallocationwillbeapplicableintheform of blurred style with the help of gaussian subtractionmethod.

Module 3: Text Recognition and Audio Output

Text Perception is performed by off-the-shelf OCR prior to output of descriptive contention from the localized text fields. The text fielddesign the minimum rectangular field for the accommodation of characters inside it. The border of the text field contacts the edge boundary of the text characters OCR generates better performance text field are authorized proper margin areas and binaries to sectors text styles. The recognized text codes are recorded in script directory.

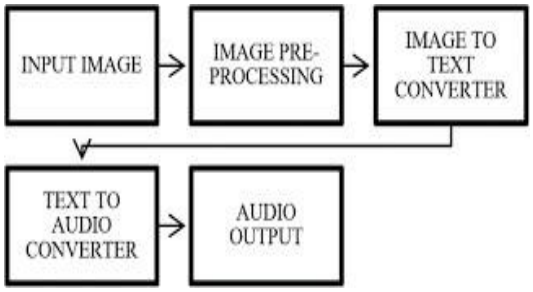

Fig .2 Conversion of text into audio output

In figure (2) the process of converting the text into audio is described. First it will take the icon as input and then icon will gets prepared through image pre-processing and then it will convert the icon into theme that encrypted text is again decrypted through text audio converter and produces the audio as output.

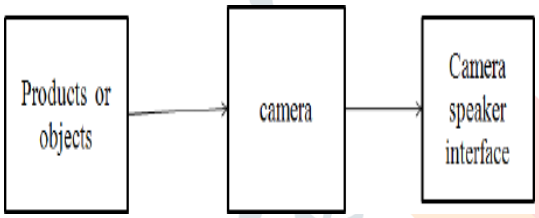

Fig.2.1 Block diagram of transmitter section

In fig(2.1) represents the transmitter section of OCR. If the product is present behind the camera it will scan through web camera in the wide angled manner and it gets interconnected through camera speaker interface. This will perform the gaussian subtraction algorithm to make the words clear for scanning .The camera will read the words or logo present in the object through RFID reader .This will exam inethewordsashumanreadableformandsend to the organization directly in the form of binary language. The scheme is interconnected to Raspberrypi3 so that it will

Again decrypted in the form of theme and then it will send the theme as audio output.

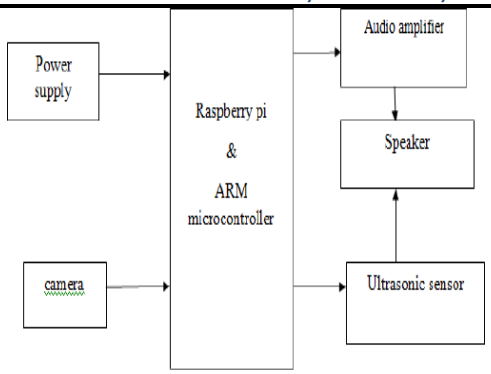

Fig .2.2 Block diagram of receiver section

In fig(2.2)denotes the process of receiver section. The system is mainly implemented with Tesseract algorithm.It will exactly decipher and extract the text from variety of sources.It automatically binarize and preprocess the images using binarization so that the deciphering of images will be easier. It able to excerpt the content and also it supports 1000 languages.It works well when the icon contains the text on single line. Crop out everything except the text for detecting the text first.

4.SYSTEMARCHITECTURE:

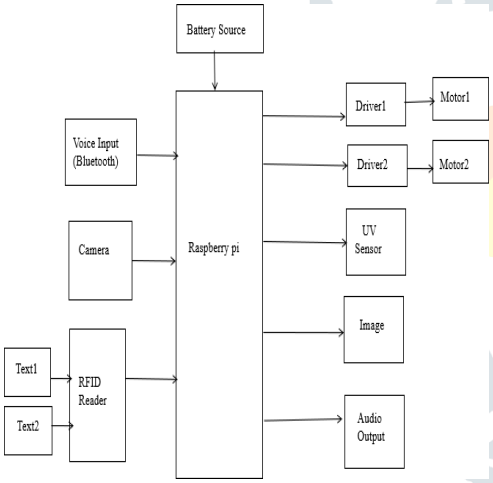

Fig .3 systemarchitecture

In fig(3)denotes the whole process of the system which is mainly used for converting the text into audio with the help of Bluetooth headset. The system will move in an automatic manner witthehelp of motors. If the command is given by the user it will move to that particular section and remains stable and then the further process will beexecuted.

5.CONCLUSIONANDFUTURENHANCEMENT:

By providing this technology people who are all suffered from vision defect may feel like normal persons and training about this device to these people can use this device efficiently. This scheme is modernized and elongated to a new form by modernizing software.This idea willlead to new automation based on neuron visual scheme will get the knowledge directly and perform the process of the scheme.

6.REFERENCES:

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