Implementation Of Blind Trolley Using Iot

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Abstract: Disability is the state of a person in which one has to depend on others for their own needs. Visual impairment is one of the disabilities of a human being. To date numerous methods had been proposed to enhance the life style of visually impaired and blind people. Still purchasing products in the supermarket without others support is tricky one for them. We proposed a system that consists of different modules such as product recognition and section information which will process on raspberry pi3 model. Product recognition includes Optical Character Recognition(OCR) and Text to Speech software which will help user to identify the product. Section information will help user to get the section information by using Bluetooth (HC-05) technology. Ultrasonic sensor will detect the obstacle and alert the user using beep sound.

INTRODUCTION

Shopping is the one of the most essential activities that people has to perform in there day to day life. But there are some people who faces many difficulties in shopping such as VIP (visually impaired people). They have to depend on others to shop in unfamiliar places. In order to address these difficulties by providing an device that will help the visually impaired people to shop independently by using different technologies. The proposed system consists of different modules such as product recognization and section information which will process on raspberry pi3 model. Product recognization includes Optical Character Recognition and Text to Speech software which will help user to identify the product. Section information will help user to get the section information by using Bluetooth (HC-05) technology. Ultrasonic sensor will detect the obstacle and alert the user using beep sound. The existing embedded shopping trolley system has automatic billing system and autonomous following of the customer. The system has RFID tag and reader which aids the billing system and it follows the customer with the help of IR sensor and it display to the customer with help of LCD. The drawback of the system is if another customer interrupts the trolley, the trolley may follow another customer. The system has no dedicated path to follow the customer and the billing 2 is displayed only to the customer with the help of LCD. The customer has to wait in a queue to pay the bill and there's no backup of the billing system with the customer. The existing focuses on the identification of different objects in a pair of images taken from the same environment, which is challenging and has wide application.

DiffNet takes a pair of images as the input and directly regresses the bounding boxes of different objects.

LITERATURE SURVEY

A Smart Trolley for Smart Shopping

Shopping is really fascinating and alluring; at the same time, it involves getting tired due to standing in a long queue for the bill and payment process. Hence, it is proposed to design a smart trolley which can take care of shopping and billing. By this, the customer can walk straightaway into the shop, purchase products using the smart trolley and walk out of the shop. He gets the e-bill through the mail, and he can view his purchase details using the shop's website. In order to realize this, we need an Arduino board, Radio-Frequency Identification (RFID) reader, RFID tag, LCD display, ESP8266 Wi-Fi module, database manager and a website to maintain product and customer details, which can be accessed by the admin anywhere in the world. This is an IOT based system where the trolley can interact with the network spread worldwide. An automated smart shopping system is formed by introducing the concept of IoT to connect all items in the grocery shop. In this system, an inexpensive RFID tag is embedded within each product. When the product is placed into a smart cart, the product detail is automatically read by the cart equipped with an RFID reader. Hence, billing is made from the shopping cart itself preventing customers from waiting in a long queue at checkout. Also, expiry date of the product is displayed and the damaged products can be identified with respect to its weight. Thus, expired and damaged products will not be considered for bill calculation. In addition to that, smart shelving is added to this system by introducing RFID readers that can monitor stock, perhaps 10 updating a central server. Thus, inventory management becomes easier. Finally, the checkout points can validate the purchase made by a client. A prototype of a smart shopping system is also presented in this paper.

An Electromagnetic Sensor Prototype to Assist Visually Impaired and Blind People in Autonomous Walking

The feasibility of an electromagnetic sensor to assist the autonomous walking of visually impaired and blind users is demonstrated in this paper. It is known that the people affected by visual diseases usually walk assisted by some supports, among which the white cane is the most common. Our idea consists in applying a microwave radar on the traditional white cane making aware the user about the presence of an obstacle in a wider and safer range. Compared to the already existing electronic travel aids devices, the proposed system exhibits better performance, noise tolerance, and reduced dimensions. In the following, the latest developments of this research activity are presented, with special concern for the miniaturization of circuit board and antennas. A laboratory prototype has been designed and realized and the first test results of obstacle detection are hereby shown to demonstrate the effectiveness of the system. As per the World Health Organization statistics there are 39 million people who are blind. Different people are facing different types of blindness such as

night blindness, color blindness etc. The ones who are partially blind aresomehow managing their lives but when it comes to a person who lost his sight completely it becomes very much difficult for him to sustain in this modern era. In order to help these visually impaired persons few systems are designed. This paper gives information about the devices which are specially designed to assist visually impaired people.

Smart Stick for Blind with Live Video Feed

The ability and capability of vision to human being is an important factor of our life ,but some person whose unable and have lack of vision because they are visually impaired this paper we introduce one smart system which is nothing but smart devise which become helpful for that visually impaired people because of it that person can be detect obstacle with help of it blind stick, also that blind person get feel for when mobile phone get vibration alert or give some oral voice message to that person. Adaptability and flexibility for blind person can be define as ability to displace with conviction and welfare to his domain but it is not happened without science and education of technology we introduced one system which is make useful for blind people with the help of it those people can detect obstacle in front of them and prevent her/himself and familiar or unfamiliar person can also following and track that person from home also ,we get information related to current place of that person for that purpose we build one android application with the help of GPS (graphic positioning system).We can locate that blind person another features like grabbing live video feed (capturing video) ,voice Message all this features are build for smart device.

Object Detection Methodologies for Blind People

Vision is the most important sense. Image plays vital role in the human perception of the surrounding environment. Digital image processing is the field which processes the digital image by using digital computer. The object identification is the difficult task for visually impaired people. There are many applications that can be used for this task, there are still limitations that require more improving.It provides the survey and an analysis of various evaluations for the technologies that used in the object identification task. For the visually impaired the idea of sensory substitution can be used. The Smart Glasses project helps blind and visually impaired people to detection and recognition the office tools around them, which they see through a small camera, the camera is fixed on the glasses. This technique helps providing job opportunities for the blind, especially office work through a voice message sent to an earphone placed on the blind ear to help him/her find various items easily and independently. This saves time and efforts. Our aim is to create an intelligent system, imitating the human eye, which transfers different scenes and images to the brain. The brain in turn analyzes the images or scenes, and based on previously stored information, the surrounding objects are identified. For this purpose, we use a small device that performs similar to the human brain, called "Raspberry Pi"; it is a small device that analyzes the images and scenes with the help of the camera, which moves the images to the small device. Then, the process of analysis begins through long complex algorithms known as the neural network algorithms. This network analyzes the images to parts in order to compare them with the

most important characteristics of the objects in the images related to the database, through which the images are compared. When ensuring that the characteristics match the mathematical equations programmed in the language of the Python, the objects in the image are detected. Finally, the sound of each tool in the database is called, and a message is sent to tell the blind about the tools. The aims of project of Blind assistance is promoting a widely challenge in computer vision such as recognition of objects of the surrounding objects practiced by the blind on a daily basis. the camera placed on blind person's glasses, MS COCO is a large-scale object detection, segmentation, are employed to provide the necessary information about the surrounding environment. A dataset of objects gathered from daily scenes is created to apply the required recognition. Objects detection is used to find objects in the real world from an image of the world such as bicycles, chairs, doors, or tables that are common in the scenes of a blind. based on their locations, and The camera is used to detect any objects. The proposed method for the blind aims at expanding possibilities to people with vision loss to achieve their full potential. The main object of the project is to design and implement a real time object recognition using blind glass.

Text to Speech for the Visually Impaired

With humans moving towards higher standards of living and to a more digitalised and interconnected world , computers prove to play an eminent role by providing the most efficient and optimal ways in achieving the required goals. Human resource and the computer system give the perfect paradigm of a trouble shooter. Such systems need to be user friendly, accurate, and multitasking as they are needed by every section of people. But when it comes to visually impaired people they (the software's/systems) pose a great deal of struggle and difficulty and the complete utilization of the facilities is hampered while using the visual interface. This can be solved by using the hearing capability. Keeping this in mind the software will be able to read the text present in the screen, webpage, document or a text entered in a text box using FreeTTS text- to-speech synthesizer. The text will be converted into a speech by analyzing and processing the text using Natural Language Processing (NLP) and then using Digital Signal Processing (DSP) technology to convert this processed text into synthesized speech representation of the text. Through the speech or voice visually impaired people can be able to hear large volume of text easier. Other than just the text to speech facility the software will have a facility to extract the text into an audio file like *.mp3,*.wav etc. It will be an efficient way in which blind people can also interact with the computer and utilize the facilities of the computer. Artificial speech has been a dream of the humankind for centuries. The computer is a silent teacher for most. Often computer instructions are transmitted visually through textual presentation-- analogous to conducting a lesson using the chalkboard without speaking. The majority of currently available educational software provides feedback through pictures, written words or electronic beeps and tunes.

EXISTING SYSYTEM

A few systems already exist that help the blind people have access to daily-life hand held

objects, but they are largely ineffective with respect to the focus area of the labelling. For example, portable bar-code readers do exist, but it is very difficult for a blind person to locate a bar code and then point the laser beam on that bar code. Also, to enable the blind people to read, braille system exists. In spite of ignoring the manufacturing cost, the system can be said to be largely ineffective with regard to the processing speed, that is, the speed at which the blind subject can identify the information and then assimilate it is too low.

LIMITATIONS OF EXISTING SYSTEM

➢ Braille system is very slow and not very practical.

➢Existing OCR systems are not automatic.

➢ IR sensor is used.

➢ Pic microcontroller is used.

PROPOSED SYSYTEM

The proposed system uses a Raspberry Pi board, an ultrasonic sensor and a webcam to recognize the text in the scene. In this, the webcam is focussed on the scene. A video streaming is obtained, from which the images are captured frame by frame. The images are refined in order to eliminate any noise that is present in it. A feature called segmentation is used in order to separate each character from other in the text. Graphical details such as icons or logos, if any, are eliminated. Each obtained character are compared with the datasets that are created as a part of the Tesseract library. The Tesseract OCR is the most efficient algorithm available that checks for the obtained character in ten dimensions. Once, the character is recognized, it must be made available as an audio output. For this, we use a software called festival. The festival is used to provide the audio output for the recognized character. Apart from these features, an extra feature is added, that enables the blind to know the type of object that he/she interacts with.(a menu, newspaper and the like). An ultrasonic sensor is included as a part of the project, that makes the project obtain characters only within a particular distance.

- Flexible for blind people.
- To convert printed books to digital text.
- Efficient and Effective to handle.
- Our proposed algorithm can effectively handle complex background and multiplepatterns
- Text to audio output.

SYSTEM IMPLEMENTATION

The requirements specification is a specification of technical requirements for the software products. It is the first step in the requirements analysis process it lists the requirements of a particular software system including functional, performance and security requirements. The requirements also provide usage scenarios from a user, an operational and an administrative perspective. The purpose of software requirements specification is to provide a detailed overview of the software project, its parameters and goals. This

describes the project target audience and its user interface, hardware and software requirements. It defines how the client, team and audience see the project and its functionality. satisfaction of the user. The system that has been developed is accepted and
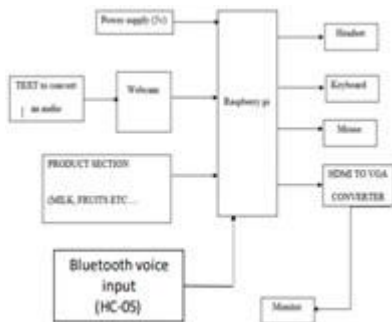
proved to be satisfactory for the user and so the system is going to be implemented very soon. A simple operating procedure is included so that the user can understand the different functions clearly and quickly. The final stage is to document the entire system which provides components and the operating procedures of the system.

Architecture Diagram

MODULE IMPLEMENTATION

A modular design reduces complexity, facilities change (a critical aspect of software maintainability), and results in easier implementation by encouraging parallel development of different part of system. Software with effective modularity is easier to develop because function may be compartmentalized and interfaces are simplified. Software architecture embodies modularity that is software is divided into separately named and addressable components called modules that are integrated to satisfy problem requirements. Modularity is the single attribute of software that allows a program to be intellectually manageable. The five important criteria that enable us to evaluate a design method with respect to its ability to define an effective modular design are: Modular decomposability, Modular Comps ability, Modular Understandability, Modular continuity, Modular Protection. The following are the modules of the project, which is planned in aid to complete the project with respect to the proposed system, while overcoming existing system and also providing the support for the future enhancement.

CAPTURING THE IMAGE :

An active Webcam can capture an image up to 30 frames per second. This capturing of the image can be accomplished from any video device including USB cameras, capture card which is connected with analog cameras, TV-boards. When a motion is detected in the motioned area by the program, then the alarm can sound, and it starts broadcasting or record a video. There is some additional feature in the program i.e., it can add text caption and image logos to the images, the date/time stamp should be placed each video frame, and the frame rate, picture size, and quality can be adjusted.

PROCESSING THE IMAGE:

The noise introduced during capturing or due to poor Quality page has to be cleared before further processing. This can be achieved by processing the image. The pixel density and quality is also adjusted and corrected by image processing. In image pre-processing, the unwanted noise in the image is removed by applying an appropriate threshold. The number of pixels added to the objects depends on the size and shape of the structuring element defined to process the image.Image processing contains the following steps.

- ▢ Filtering
- ▢ Edge Detection
- ▢ Background Separation

a. FILTERING

The technique which is used for modifying or enhancing an image filters. For example, to emphasize certain features or to remove other features of an image, the filter is the only solution to achieve these modifications. Filtering includes smoothing, sharpening, and edge enhancement of the image and it is implemented under image processing

b. EDGE DETECTION

Filtering is a neighbourhood operation, by applying some algorithm to the values of the pixels in the neighbourhood then the pixels of the View Policy Details output image corresponding to the input is determined. The location relative to the pixel defines the pixel's neighbourhood of some set of pixels. The filtering process in which the value of an output pixel is a linear combination of the values of the pixels in the input pixel's neighbourhood is called linear filtering.

c. BACKGROUND SEPARATION

The major pre-processing step in many vision based application is the background separation or subtraction. Consider the cases like the information about the vehicle is extracted from the traffic camera or a static camera takes the number of visitors entering the visitor counter etc. In all the above cases it is necessary to extract the person or vehicle alone. Technically, the moving foreground from static background is to be extracted

1. TEXT EXTRACTION AND AUDIO INPUT

The aim of Optical Character Recognition (OCR) is to classify optical patterns (often contained in a digital image) corresponding to alphanumeric or other characters. The process of OCR involves several steps including segmentation, feature extraction, and classification. In principle, any standard OCR software can now be used to recognize the text in the segmented frames.

TEXT DETECTION:

This phase takes image or video frame as input and decides it contains text or not. It also identifies the text regions in image.

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TEXT LOCALIZATION:

Text localization merges the text regions to formulate the text objects and define the tight bounds around the text objects.

TEXT TRACKING:

This phase is applied to video data only. For the readability purpose, text embedded in the video appears in more than thirty consecutive frames. Text tracking phase exploits this temporal occurrences of the same text object in multiple consecutive frames.
It can be used to rectify the results of text detection and localization stage.

TEXT BINARIZATION:

This step is used to segment the text object from the background in the bounded text objects. The output of text binarization is the binary image, where text pixels and background pixels appear in two different binary levels.

CHARACTER RECOGNITION:

The last module of text extraction process is the character recognition. This module converts the binary text object into the ASCII text.

2.   APPLICATION OF TEXT EXTRACTION

Text extraction from images has ample of applications. With the rapid increase of multimedia data, need of understanding its content is also amplifying. Some of the applications of the text extraction are mentionedbelow

A.VIDEO AND IMAGE RETRIEVAL

Content based image and video retrieval is the focus of many researchers for the last many years. Text appearing in the images gives the essence of the actual content of the image and displays the human perception about the content.

b.   MULTIMEDIA SUMMARIZATION

With the vast increase in the multimedia data, huge amount of information is available. Because of this overwhelming information, problem of overloaded information arise. Text summarization can provide the solution for the problem.

c.   INDEXING AND RETRIEVAL OF WEB PAGES

Text Extraction method from web images can truly improve the indexing and retrieval of web pages.
Main indexing terms are embedded in the title image or banners.

3.   TEXT RECOGNITION AND AUDIO OUTPUT

Text recognition is performed by off-the-shelf OCR prior to output of informative words from

the localized text regions. A text region labels the minimum rectangular area for the accommodation of characters inside it. The border of the text region contacts the edge boundary of the text characters. OCR generates better performance text regions are assigned proper margin areas and binaries to segments text characters.

CONCLUSION:

The proposed system will enable visually impaired people to shop independently in supermarket. Being specific gadget for product identification, Section Information and obstacle detection can be designed. It makes the use of RFID and raspberry-pi technologies for providing the smart environment for the visually impaired. To solve the common aiming problem we have implemented motion-based method to detect the objects of interest. Text extractions are done using stroke orientation and distribution of edge pixels. The text characters are recognized using Optical Character Recognition, the text codes are transformed as speechfor blind persons.

FUTURE ENHANCEMENT:

Our future work will extend the text localization algorithm with further more features and we will address the human interface issues associated with text reading by the blind user.

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