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Smart Visibility Glasses For The Blind

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Abstract: *People with visual impairment face various problems in their daily life as the modern assistive devices are often not meeting the consumer requirements in term of price and level of assistance. This paper presents a new design of assistive smart glasses for visually impaired students. The objective is to assist in multiple daily tasks using the advantage of wearable design format. As a proof of concept, this paper only presents one example application, i.e. text recognition technology that can help reading from hardcopy materials. The building cost is kept low by using single board computer raspberry pi 2 as the heart of processing and the raspberry pi 2 camera for image capturing. Experiment results demonstrate that the prototype is working as intended.*

Keywords: *Character detection, Color detection, Image processing, Raspberry pi, Shape detection.*

I. Introduction

The number of visually impaired individuals is growing over the past decades. As reported by the world health organization (WHO), about 285 million people worldwide are estimated to be visually impaired. This paper presents a new design of smart glasses that can give help in multiple tasks whereas keeping at an occasional building price. The design uses the new raspberry pi a pair of single board pc, a camera, and an earpiece to convey information to the user. Visually impaired individuals typically square measure smitten by different sensory data so as to avoid obstacles and to navigate. For example, the movement of dynamic hurdle gives rise to noise allowing blind people to decide the approximate/rough location using their auditory senses. The additional use of tactile senses is necessary for precise obstacle position. For this purpose, a white cane is sometimes employed by visually impaired which has 2 disadvantages. It is relatively short and also the detection happens solely by creating contact with the obstacle that may typically is also harmful. Another widespread navigation tool for blind individuals could be a service seeing-eye dog. Compared to white canes, dog guides square measure ready to observe obstacles still as on the road them, but they're high-ticket and have really less operating life.

II. Literature Survey

In a quickly flourishing country like our unnumbered variety of makes an attempt has been created for the welfare of particularly ready folks of our society. One of such makes an attempt is that the project Project Prakash", Associate in nursing empathic try towards the blind youngsters to assist them gain data of a collection of obstacles around them by using their brains. The most common browsing device is Braille reader which may read and/or write exploitation a briefing of dots to make completely different letters. Another device is that the audio book that browses books or newspaper saved in audio format by bound suppliers. Screen browser and e-book readers read digital content from monitor, Associate in Nursing convert the text to an audio format employing a text-to-speech synthesizer. Eyewear devices are the most recent technology. OrCam may be commercially free glasses that use Associate in nursing embedded laptop with a gesture (a purpose of finger) recognition system to perform completely different tasks includes reading and convey them to the user in an audio format. Esight is another eyewear technology for people with low vision. It captures and processes live scenes, and displays them back on a specialized screen ahead of the users eyes.

III. Review

Sheth et al worked on how blind people can be able to detect any type of pits, potholes and several ups and downs by using a smart white cane where they have used ultrasonic sensors. In this device a multilingual system for audio feedback cannot be used as a result of it will record just for 680 seconds. The idea that can be seen in has an ultrasonic sensor, a water sensor and a pit sensor. It conjointly consists of a GPS system however here the user must provide the current location because the input itself. The method of doing so has not been

mentioned herein. In it can be observed that it consists of a video camera on the frame itself as well as a computer processing unit precise enough to get fit in the pocket and also the software package that gives pictures of objects within reach to clear displays on the eyepieces.

IV. Block Diagram And Description

4.1 Image acquisition: The camera used, captures an image.
4.2 Enhanced image: Image enhancement is the process of adjusting digital images so that the results are easier for display or further image processing.
4.3 Character segmentation: It is difficult to segment individual characters and shapes without the support from recognition and contextual analysis.
4.4 Segmentation of image: It is the methodology of dividing a digital image into multiple sets of pixels spoken as super-pixel. The objective of segmentation is to simplify the representation of an image into something that is simpler to process.
4.5 Character database: A structured set of data held in a computer, especially one that is accessible in various ways. Character database contains information and data about all the characters that we need to process.
4.6 Feature extraction: It is a specific form of dimensionality reduction. It is a method of capturing visual content of image for retrieval and indexing. When input to the indexing algorithm is too large to be proceeding and it is having much data but not more information. Then computer file are going to be born-again into reduced illustration set of options. Feature extraction makes simple resources required to describe the large set of data.
4.7 Image to text converter: This module comprises of image and speech processing.
The main aim of this module is to amass a 3D world real image of any text constraints space and to convert this image into text followed by providing audio output using speech processing.
4.8 Output: The output obtained is in the form of speech. A speaker or any kind of headphones can be used to obtain the output.

V. Conclusion

This paper presents a replacement construct of sensible glasses designed for visually impaired folks victimization low value single board pc raspberry pi a pair of and its camera.
For the demonstration purpose, the glasses square measure designed to perform text recognition.

The system capability but is simply extended to multiple tasks by adding additional models to the core program, albeit restricted by the dimensions of the raspberry pi SD card. Each model represents a specific task or mode. The user will have the specified task run severally from the opposite tasks. The system style, operating mechanism and principles were mentioned at the side of some experiment results.
This new construct is anticipated to boost the visually impaired students lives despite their economic things.

Immediate future work includes assessing the user-friendliness and optimizing the facility management of the computing unit. The paper objective is underlined by the need of voice assistant system for the increasing variety of blind folks everywhere the world. The "Smart Glass for Blind People" is much, a possible device and may be handily carried by any visually handicapped

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