Bus route recognition for visually impaired people

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Abstract. Most important part in human's life is our six senses, if we are not having any one of the senses, it will be more difficult to run our day to day life. Here we are going to help the visually impaired peoples to listen where there are and what are they going to do next as a sense in our body. visually impaired usually get information for their next move from others, this may create a inferiority complex to them that they can't be like normal human beings, they are always dependent on others. To make them fell self-confident and to face their obstacles by themselves we have specially customized a smart cap for visually impaired peoples, as they can help them in their day to day life. Vision plays a significant role. Persons without vision can gather information through their hearing skills. The proposed system is an innovative implementation of a smart guidance system for those with vision. The system is a novel and real-time cost-effective technique. The system consists of three modules: voice search module, image processing module and voice processing module. These modules are executed using the keyword function search, which is in voice form, provided by the user. The system combines the concept of optical character recognition and the text to speech synthesizer. It involves extracting text from the image and translating the text into speech; this makes it easier for the user to read the text. From a computer standpoint, extracting text from color images is a difficult task. It can also be used to identify the bus name and bus number at the bus stop or bus stand for the blind and prevents it from being used by an ultrasonic sensor and is communicated to the user by the vibration sensing mechanism.

Keywords - Visually challenged, Pi cam, Speakers, Raspberry Pi

1. Introduction
The visual impaired have uncommon needs and administrations including public vehicle to give them rights and capacity to move easily and openly starting with one spot then onto the next. The prerequisite for effortlessness and solace are charge out of life capacity to move autonomously starting with one area then onto the next. Utilizing various methods such has for example legs, and cars, metro and so forth. Be that as it may, not every person can just depend all alone. In voyaging like some sort of handicapped. One of these weaknesses is visual deficiency; this sort network development faces numerous issues. Also, visual impairment restricts the sort of traffic an individual can utilize the postponement brought about by the utilization of such transport settings. The most ordinarily utilized methods for transport for the visually impaired are the public traffic is viewed as significant the object of heading out to numerous nations. For instance, In New York the level of individuals who utilize the public 55% of traffic. Tragically, public transportation isn't the most straightforward choice use and openness of the visually impaired in numerous nations. For instance, for transports, the visually impaired are experiencing issues in perceiving and evaluating the appearance of transports on transports Stations. Likewise, they can't perceive the transport number distinguish the correct transport to climb [1]. Dissimilar to customary
individuals travel freely and need uphold in directing the visually impaired. They keep on dodging mishaps. This can influence their exhibition as dynamic part's locale. Likewise, the trouble is utilizing the people in general. The traffic of the visually impaired will additionally seclude them and couldn’t carry on with their typical lives. There are frameworks that exist, intended to help the outwardly debilitated and outwardly disabled, for example, those gave in [2–4]. Be that as it may, existing task help development frameworks of the visually impaired and dazzle public vehicle isn’t agreeable, this is inspiration driving this work. This article diagrams a framework to assist the visually impaired with heading out starting with one spot then onto the next easily and freely give total and clear data about: Visitors to the bus stop to caution the transport driver, closest bus stop and transports to visit and their courses at a bus stop [5–6]. The proposed system includes a pi camera, audio enhanced microphone, US sensor, Rasp Pi, headphone for voice and a vibration motor. After the keyword is received by the Raspberry Pi, the Pi camera captures the image according to the given keyword [7]. In the form of braille, the books and documents available to the blind are very few compared to the numerous books printed daily. To access information in a text, a person needs a view. Visual impaired people face many problems such as alignment, focus, accuracy, mobility, and performance by accessing text in printed using existing technology. Today, there are few systems such as movable bar code readers are designed to help blind in order to detect the various products that helps the visually impaired to obtain the data about their products through communication and Braille [8]. It is observed that they are still finding it as a huge problem to move their routine and it is primary to make basic strides with the upcoming methods to assist them with living the present independent of their inability. Reading is one of the most essential one in today’s society. Getting to content reports is very troublesome for visually impaired in much of the time, for example, perusing the content. Individuals who are visually impaired or have huge visual disability to peruse printed marks and item bundles will advance free living and encourage financial and social independence. Ongoing advances in computer vision, computerized cameras and convenient PCs have made it conceivable to help people by creating camera-based items that coordinate computer vision innovation. The objective of the work is visually impaired learners face difficulties in researching and taking in book content, which requires proper study. This results in better academic execution when set up in organizations. Similarly, in the product and business industry, the blind is finding diligence.

2. Methodology
The proposed work permits outwardly disabled individuals to tune in to its details as opposed to perusing the content picture. This savvy gadget empowers individuals to peruse the printed text adequately and effectively. It utilizes an outwardly disabled, camera-based assistance gadget to peruse text archives. Figure 1 shows the proposed framework incorporates a pie camera, sound amplifier, ultrasonic sensor, raspberry pie, and voice and vibration engine helpline. To computerize the printed text document, the bag is used as a camera input device. The software module OCR engine is used to process the scanned document. This system is used to identify writing and reading lines. To computerize the printed text document, the bag is used as a camera input device. The software module OCR engine is used to process the scanned document. This system is used to identify writing and reading lines. The system consists of three courses: voice search package, image processing package and voice processing module. These modules are activated by the keyword function search in the form of voice provided by the user. After getting the keyword with the Raspberry Pi, the PI camera captures the image according to the given keyword. It combines OCR and TTS concepts. Extract image text and convert text into text; this will make visually impaired speech easier to read. OCR is a method of synchronization with the symbolic meaning of letters, symbols and numbers. It is a method of converting printed scanned images into a computer process. OCR is used to create and entertain a structure that is not a computer. This proposed system includes a webcam that interacts with the Raspberry Pi that receives print text pages. Raspberry Pi encoding is done in five languages. The camera that captures the image is then converted to text. Raspberry Pi has an audio board that can be used to listen to the release of a main phone or speaker. After converting the image into text, the Raspberry Pi which take up to a few milliseconds to convert text to voice or audio output. The final identified text document is provided by the publication depending on the user’s choice. The help desk and Raspberry Pi are attached to a portal or speaker to help you spell the text document without the help of others.
3. Results and Discussion
The system performs some techniques: image capturing, extracting image, converting text to audio, audio is allowed play through speakers

3.1 Image Capturing
In image capture, if the keyword is given by the user, the computer will capture the printed page and the text image will be captured by the camera. The captured image will be of high quality and proper recognition, due to the high-resolution camera.

3.2 Button to Raspberry
Adding button to the Raspberry Pi and camera in the beginning and working for the output, once after finishing the system we produce an automatic working model for the visually challenged people. Figure 2 shows the button to the Raspberry Pi and camera.

3.3 Extracting image
It involves three steps, they are
- Normal image
- Linearization
- Number extraction
The confined image is examined for skewing
3.4 Image to text Convertor

After the extraction process takes place, ASCII characters are processed. Each character has a corresponding template. It has been updated to a normal text data. This process is also provided for audio jack audio output. Figure 3 shows the Raspberry Pi with camera button and audio speakers.

First the Pi camera is launched and then the program is added to the Raspberry Pi kit. The program is hilly in shape. The program file was added to change the text to audio. Then the Wi-Fi module is configured. After configuration, the application programming Interface (API) is interactive with the microphone interface. Then, the API has been interface to the audio interface. If any keyword is found, the API burdens the audio search. If the keyword does not exist, it will return to the interface API for the microphone interface, and then the following steps will take place. If any keyword is found, the API burdens the audio search.

Then, if you read the keyword, it reads the book. The keyword reads the bus number and the bus name if it is a name. After the keyword has been detected, the Pi camera files burdens to capture the image. By using the OCR technique, it converts the image to Text header processing. This text is replaced by an audio file processing TTS technique. Finally, the audio file output is interactive with the audio jack. Similarly, the next process takes place. Using this technique, the visually impaired can read the book and easily identify the bus.

3.5 Converting text to audio

Figure 4 shows the Raspberry Pi with camera and audio speaker, finally the extracting stage, the noise-free image is handled with the segment phase. Then is converted as audio and made the vision less people hear the text using audio automatically.
4. Conclusion
This proposed system is an innovative implementation of speech transfer text using the Raspberry Pi for visually challenged. This is an innovative and real-time cost advantage method that enables you to listen to the contents of the bus route numbers, rather than reading for blinds or they don’t need others help. By using keyword search and audio processing algorithms, the bus stop or bus stand can be easily identified for people with impaired vision and the number of buses, which is an ultrasonic Help with the barrier exclusion using the sensor. The OCR and TTS Synthesis sector is actualized to convert content data from images into an audio. We can change the language as per the users.

- It is concluded that the three modules: voice search module, image processing module and voice processing module. From these modules are executed using the keyword function search, which is in voice form, provided by the user. The system combines the concept of optical character recognition and the text to speech synthesizer. It involves extracting text from the image and translating the text into speech; this makes it easier for the user to read the text.

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