PERSONAL ASSISTANT FOR BLIND PEOPLE

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ABSTRACT: Visual impairment is one of the major problems that people face. They need human assistance to do many activities in daily life. This paper describes the designation of the smart assistance device to help blind people by using multiple sensors. The device mainly provides basic services including object detection, falling detection, water detection, heart-beat rate detection, temperature detection and emergency button to send alert messages which makes day to day activities easier for them. The microcontroller will retrieve data and it passes vibrations to the user through sensors which will notify about detected things. It is an efficient device and it would be great assistance to blind person.

Keywords-smart assistance; sensors; GPS module; Wi-Fi module; ARM controller; AWS cloud

I.   INTRODUCTION

Blindness is one of the disability problems. In our daily life we see many blind people, some are partially blind and some are completely blind. One of their major problems is transportation like travelling in trains, buses, crossing roads etc. In order to solve all these problems we came with a smart system. The main aim of our project is to provide single system to blind people in order to reduce their dependency on others in their daily life by using technology. Hence they can live their life without depending on the others.

Many solutions have been provided to assist blind people. Some solutions include blind stick integrated with GPS-GSM module with various sensors installed on it but it is quite complex. Sensing of immediate surroundings against obstacles, this provides only object detection. A falling detection system has provided a solution to elder people's movement. Even though they above system provide good solution to problems of blind people they are not very efficient.

In this paper, we have discussed about smart system which is designed to provide to solution to few problems of blind people. We have developed a smart assistance device which have multiple functionalities .This is quite cheap and easy to use. In our project we have used multiple sensors to perform multiple functionalities and microcontroller is the brain of our project which is used to pass the vibrations of sensors to the user to notify him about the detections through speaker and we have used AWS cloud to store data which is retrieved using Wi-Fi module and also GPS module to track the location of blind person and an emergency to notify caretaker in case of any emergency and also LCD to display temperature and heartbeat rate of user to the care taker. This proposed system mainly concentrates on providing safety to a blind person.

II.   LITERATURE REVIEW

There are some technical systems which would help blind people.

Smart stick is integrated with GPS-GSM module, sensors serve as its eyes and the microcontroller as its brain, which will receive the data from the surroundings and pass on commands to the user notification setup. GPS keeps on monitoring the location of the blind. But in our project we are using cloud for storing the data and retrieving the data through WIFI module [1].

According to the World Health Organization (WHO) there are around 285 people visually impaired people in the world. Among the 285 million people, 39 million people are completely blind and 246 million people are low vision .The limited vision of the sightless people face difficulties while reading, locating objects, etc. Blind people need some assisting device to assist them interact with the environment. For ages, they need used sticks to assist them locate obstacles in their way. [2]

During this system it contains two components; sensing of the surrounding environment against obstacles for the visually impaired person and warning about the obstacle by means of vibration together with feedback system [3].

 A falling detection system has been designed by Wang Rong, et al. has provided an answer to detect elder people's movement. Also, as a risk warning service, the

falling detection system will be wont to protect blind and visually impaired people and alarm their family when abnormal event happens [4].

In this paper, the device uses a multi-sensor architecture and quite complex smart processing to provide the user with information useful to perform urban mobility task, such as human detection and walking in crowd condition etc [5].

In this paper, the intelligent assistant would really like help a blind user to be independent and ready to get into a 3-D dynamic environment. This technique captures images from the encircling 3-D environment, either by the user's command or during a continued mode, and converts the visual description of every image into verbal description [6].
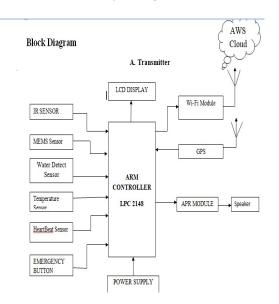
In this paper, the OCR technology is been used. Here the information or message is been captured by camera and image quality of the characters which are been captured by camera are converted through the speech [7].

III.   METHODOLGY

The block diagram is shown below. It shows all important components that are embedded in the system. AS Shown ARM controller is connected to LCD, MEMS Sensor, Wi-Fi and GPS.As soon as connects power Supply to the system ARM controller I/O Pins, ADC, UART and Timer will get initialize. MEMS Sensor is used to detect the fall of the candidate. When Controller detects the fall it will send GPS location via SMS to care taker using cloud. IR sensor is used to detect the object s in the path and also prevents the accidents that are . If controller detects any object then an audio message will play to take diversion. Water detect sensor is used to detect water present in the walking path, if sensor detects water in the path controller will alert the candidate .Emergency switch is provided to the user to send emergency alert message along with current location.ESP8266 Wi-Fi Module is used send the data to Amazon web services so that we can store the data and check anywhere from the world.

In this paper, a camera is used to read the character using the technology OCR. Here they have used the prebuilt Tesseract software developed by Google .The Braille cell concept has been implemented so that the blind person can read the character which is captured by camera [8].

Hence studying from different references in this paper we used IR sensor, GPS and GSM technology which tracks the location of blind person and sends a message to guardians of the user. Accelerometer sensor is used to detect the fall of the candidate, when controller detects the fall it will send GPS location via SMS to guardian of user. IR sensor is used to detect the object in the path if controller detects any objects then an audio massage will play to take diversion. Emergency switch is provided to the user to send emergency alert message along with current location. The main of aim of this project is used to provide assistance to blind person as well reduce the storage space by using the cloud as the platform which can be accessed by using the WIFI module.

IV.   IMPLEMENTATION:

This system can be implemented in the form of blind stick and jacket. The stick is used to detect the objects in the path of the blind person based on the type of obstacles the information will be send to the ARM microcontroller. The received data is analyzed, output will be displayed on the LCD screen and voice audio message will be played. Water sensor is used to detect the presence of water on the paths of the blind person if it is present an alert audio message will be played. MEMS sensor detects the fall of the candidate and data message will be sent. to the care taker or relatives. The panic button is used by blind person in case of any emergency and the location of the blind person will be traced and will be sent to care taker

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or relatives. All these data will be stored online in the cloud here we are using (AWS) Amazon web services and can be accessed anywhere in the world.

V RESULT:

The basic problem for blind people can be overcome by this electronic device and the result of this project is to analyze the distance from the object to device. If the blind person falls down an alert message will be sent to the care taker or relatives which is been sensed by MEMS sensor. The water sensor is used the water presence in the walking path of the person so that he/she can avoid drenching or slipping.GPS module is used to track the location of the person if he/she is misplaced and an alert message will be sent along with the location. All the data will be stored in the AWS cloud and accessed by WIFI module. All the alert messages will be played through audio message.

VI. CONCLUSION

In the world, 4.25% people are blind or visually impaired from which 14% people are blind. Our research is concentrated on developing a system that reduces the issue of reckoning on people. Supported the above facts we are able to conclude that:

1. The device could be a simple, cheap, easy to handle system, which is provides the assistance for blind persons.

2. it's a user friendly device and might serve the aim of potential beneficiaries.

3. So, the aim is to construct and style a conveyable, simple, less expensive device which will help visually impaired people to manoeuvre in unfamiliar environment also. Proposed system is considering usefulness of all ages.

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