

Navigation shoes for impaired person

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Abstract

Eyes play vital role in our day to day lives and are maybe the foremost valuable gift we've got. This world is visible to us as a result of are blessed seeing. However there are some individuals that lag this ability of visualizing these things. Because of this, visually impaired folks face several challenges once getting unknown public places. 285 million individuals are calculable to be visually impaired worldwide: 39 million are blind and 246 have low vision. Hence, wearable device should design for such visual impaired individuals. Smart shoes is wearable system design to give directional info to visually impaired folks. To supply good and smart navigation steering to visually impaired folks, the system has nice potential particularly once integrated with visual process units. Throughout the operation, the user is meant to wear the shoes. Once sensors can discover any obstacle, user are educated through android system getting used by the user. The smart Shoes together with the application on the android system shall facilitate the user in traveling severally.

Keywords— *STM32 controller, Bluetooth, Vibration motor, Ultrasonic sensors*

I. INTRODUCTION

Blindness, low vision, visual disorder and vision loss have dramatic impacts on people experiencing such disabilities. These carry with them physiological, psychological, social, and economic outcomes, therefore impacting the standard of life and depriving such people from performing arts several of the Activities of Daily Living (ADL), the foremost crucial of that is navigation and quality.

visual defect may be a qualitative term that describes the clinical condition whereby people haven't any light-weight perception as a results of total vision loss. visual defect additionally refers to people who have therefore very little vision that they need to trust preponderantly on different senses as vision substitution skills. On the opposite hand, visual impairments may be a qualitative term used once the condition of vision loss is characterised by a loss of visual functions at the organ level, like the loss of visual sense or the loss of field of vision.

associate embedded system may be a ADPS with a faithful capability within an even bigger mechanical or electrical system, often with continuous calculation imperatives. it's embedded as a element of a complete appliance often as well as instrumentation and mechanical elements. Embedded systems management varied devices in like manner utilize nowadays. Automaton may be a operating system created by Google for transportable systems. It depends on the UNIX operating system bit and supposed for bit screen cell phones, for instance, cell phones and tablets. Android's UI is mainly in light-weight of direct management, utilizing bit signals, for instance, swiping, sound and compressing, to manage on-screen objects, aboard a virtual console for content data. Our essential goal here is to form the most effective utilize of the sensors that ar accessible handy for constant deterrent location and route. The sensors to be used have to be compelled to of least size and value giving most extreme quality keeping in mind the tip goal to assist a visually impaired person explore and move around independent. the utilization of automaton is confined to its highlights that don't seem to be visual however rather can in any case facilitate a visually impaired person. The consumer ought to have the capability to launch his application while not viewing something on the device with the only facilitate gracious the hardcoded keys on the automaton device. All the highlights of the sensors, Arduino microcontroller and automaton ar to be consolidated to stipulate another device for independent movableness of a visually impaired person.

This project presents a paradigm model and a system construct to produce a wise electronic aid for blind individuals. This project aims at the event of associate Electronic travel Aid (ETA) kit to assist the blind

individuals to search out obstacle free path. This ETA is mounted to the shoe. once the article is detected concerning the shoe alerts them with {the facilitate|the assistance} of vibrating circuit and additionally in advancement with help of speakers or head phones that's voice command with the assistance of automaton application. Here the facility offer is main criteria.

II. LITERATURE SURVEY

S Yarisha Heera and al.[1] The signal acknowledgment framework changes over Indian language to discourse with the assistance of assortment of devices like flex device, gyration and instrument to effectively decide the position and introduction of the hand motion. Sensors are consolidated on a glove to inform apart the signals AND alter over it to discourse with the assistance of a Bluetooth module associated an golem smart Phone. The gloves will facilitate in delivering store-bought discourse.

S.Chew (2012) planned the good white cane, referred to as Blind spot that mixes GPS technology, social networking and ultra-sonic sensors to assist visually impaired individuals to navigate public areas. The GPS detects the placement of the obstacle and alerts the blind to avoid them striking the obstacle victimization ultra-sonic sensors. however GPS failed to show the potency in tracing the placement of the obstacles since ultra-sonic tells the space of the obstacle.

Benjamin et al (2014) had developed a wise stick victimization optical device sensors to notice the obstacles and down curbs. Obstacle detection was signalized by a pitch "BEEP" employing a mike. the planning of the optical device cane is incredibly easy and intuitive. The stick will solely notice obstacle, however cannot offer psychological feature and psychological support. There exists solely beep sound that triggers any obstacle and there's no any help to direct them.

Reference paper [4]: Central Michigan University (2009) developed AN electronic cane for blind those who would offer discourse data on the surroundings round the user. They used RFID chips that are established into street signs, store fronts, similar locations, and therefore the cane reads those and feeds the knowledge back to the user. The device additionally options AN ultrasound device to assist to notice objects prior the cane tip. The good Cane, that has AN supersonic device mounted on that, is paired with a messenger- vogue bag that's worn across the shoulder. A speaker settled on the bag strap voice alerts once AN obstacle is detected and additionally directs the user to maneuver in several direction.

Mohd Helmyabd Wahab and Amirul A. Talib et al (2013) developed a cane might communicate with users through voice alert and vibration signal). supersonic sensors are accustomed notice obstacle before, since supersonic sensors are sensible in police work obstacle in few meters vary and this data are going to be sent within the style of voice signal. This voice signal is sent via speaker to the user. Here blind individuals may realize it troublesome in traveling with none emergency alert instead of having solely supersonic sensors.

Alejandro R. Garcia Ramirez AND Renato Fonseca Livramento district attorney Silva et al (2012) designed an helpful technology device referred to as the electronic long cane to function a quality aid for blind and visually impaired individuals. The author implements the cane with AN technology style AND an embedded electronic system, which inserts within the handle of a standard long cane. The system was designed victimization somatosense sensors to notice obstacles on top of the waist. It works in such the simplest way once AN obstacle is detected; the cane vibrates or makes a sound. but this technique solely detects obstacle on top of the waist.

Joao José, Miguel Farrajota, Joao M.F. Rodrigues (2013) designed a wise stick example. it absolutely was tiny in size, low-cost and simply wearable navigation aid. This blind stick functions by addressing the world navigation for guiding the user to some destiny and native navigation for negotiating ways, sidewalks and corridors, even with shunning of static further as moving obstacles. instead of that, they fictional a stereo camera worn at chest height, a transportable laptop during a shoulder-strapped pouch or pocket and just one headphone or tiny speaker. The system is inconspicuous, and with no hindrance whereas walking with the cane. additionally it doesn't block traditional sound within the surroundings.

Shruti Damhare and A.Sakhare (2011) designed a synthetic vision and object detection with time period help via GPS to produce a coffee value and economical navigation aid for blind which provides a way of artificial vision by providing data regarding the environmental state of affairs of static and dynamic objects around them.

III. METHODOLOGY

Figure 1 shows the Block diagram of the proposed system using stm32 controller.

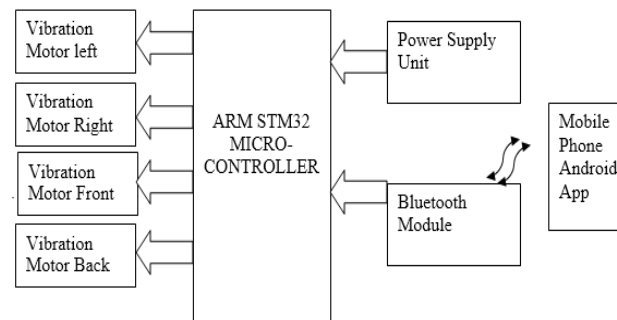
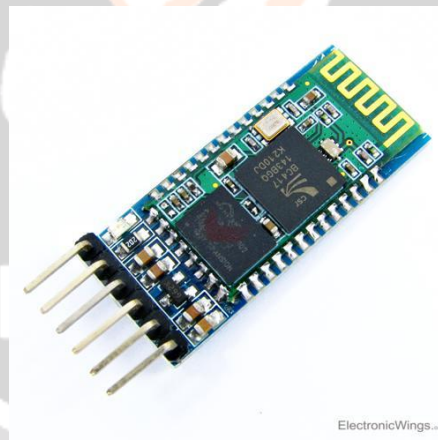


Figure 1. Block diagram of system

We are proposing novel technique based on IoT implementation. Wearable device i.e. smart navigational shoe is proposed. Electronic kit is fixed in shoe which can be used by blind or visual impaired person. Hardware kit consists of four vibrators, one Arduino, Bluetooth connection and one battery. Sensors will sense any obstacle detected while moving along path. It will be informed to users. An Android application is developed which is integrated with smart navigational shoes. User will enter source and destination in phone. Path is displayed using map to users. This application is integrated with shoes. According to path, vibrators will vibrate along that path. If left turn need to take according to navigation, Vibrator set on left side will vibrate. If right turn need to take according to navigation, Vibrator set on right side will vibrate. Architecture diagram of hardware is as follow. Bluetooth connection is provided through which mobile and electronic part can be connected. Approach is to make user friendly system for blind as well as visually impaired person.

A. **Bluetooth Module**

HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration.



It has range up to <100m which depends upon transmitter and receiver, atmosphere, geographic & urban conditions.

It is IEEE 802.15.1 standardized protocol, through which one can build wireless Personal Area Network (PAN). It uses frequency-hopping spread spectrum (FHSS) radio technology to send data over air. It uses serial communication to communicate with devices. It communicates with microcontroller using serial port (USART).

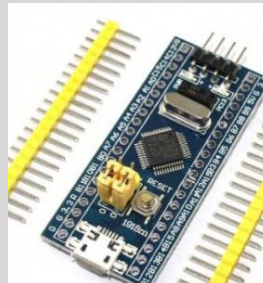
B. **Vibration motor**

Vibration motor is a compact size coreless DC motor used to informs the users of receiving the signal by vibrating, no sound. Vibration motors are widely used in a variety of applications including cell phones, handsets, pagers, and so on. The main features of vibration motor is the magnet coreless DC motor are permanent, which means it will always have its magnetic properties (unlike an electromagnet, which only behaves like a magnet when an electric current runs through it); another main feature is the size of the motor itself is small, and thus light weight. Moreover, the noise and the power consumption that the motor produce while using are low. Based on those features, the performance of the motor is highly reliable.



C. STM32 controller

In this system stm32 is a simple microcontroller board and provides an environment for open source development that will allow you to make computers that drive both functional and creative projects alike. This microcontroller merge the values from all the flex sensors and according this input data to audio file will be played.



IV. CONCLUSION AND FUTURE WORK

In order to create use of latest technology, we've proposed android based navigational shoes system. wearable electronic kit is projected. Main goal of this proposed system is to give navigation help for this visually impaired person. Sensors can observe obstacles and vibrators can vibrate according direction. Right cultivator can vibrate once right swing ought to be taken and left shoe can vibrate once left swing should be taken. Our approach is build simple application to create visually impaired person to live severally.

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