Advanced Navigation System for Blind

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Abstract

    The primary target of this paper is helping the visually impaired/old and ignorant individuals and walker individuals utilizing Wireless Sensor Networks (WSN). Two units specifically the traveler unit and the transport unit comprising of diverse modules like the PIC controller, voice synthesizer, discourse acknowledgment framework, ZigBee and a GPS module is utilized. With the assistance of the ZigBee module in both the units the traveler distinguishes the transport it needs to board. The microcontroller controls the GPS module and the Speech recognizer that are utilized for following the area and knowing the coveted area given by the traveler separately. In the event that the area coordinates, the voice synthesizer will advise the traveler by means of headphones joined to the traveler unit to get down at the coveted area. This task is additionally gone for helping the senior individuals for free route.

Keywords: *GPS (Global Positioning System), voice synthesizer, speech recognition, ZigBee.*

I. INTRODUCTION

    More than 200 million people everywhere throughout the world are outwardly tested or ignorant. These individuals face unending difficulties taking into account their absence of vision and comprehension. It is troublesome for such individuals to explore from spot to put with the always expanding movement and populace makes it more testing. The present era uses Watch canines and Walking sticks to conquer this issue however they are not generally helpful in cases like movement or if the individual needs to travel long separations by some open transport. So with a specific end goal to succeed this issue a conceivable proposed remote framework utilizing ZigBee which will control the general population and inform them about the transport number is utilized .Further GPS will likewise advise the individuals which course is the transport taking and this will likewise offer assistance them to take the most effortless course conceivable.

II. WORKING PRINCIPLE

The working of the framework incorporates two units: The transport unit also, the traveler unit.

A. The Bus Unit

The units utilized as a part of transport are:

1) ZigBee Receiver

    This module is utilized for abnormal state correspondence as a part of individual region systems which has low power and low voltage remote applications. It utilizes IEEE 802.15 standard. Its transmission separations are between 10-100 meters line of sight. The ZigBee in transport gets the sign from User individual's unit and the transport stops at transport station for empowering the individual to enter the transport.

2) Microcontroller PIC16F887:

    The PIC controller in transport unit is utilized for the interfacing of the LCD show. This presentations the area and in this way makes a difference the User to get down to the wanted area.

B. The User Unit

1) ZigBee Transmitter

    The unit given to the User individual would have a ZigBeetransmitter which will transmit signal so as to inform the driver in the transport about his vicinity at the transport station. The point of interest of ZigBee over RFID is that it has lesser expense than RFID tag and RFID per user. Secondly; it has two-way correspondence that is to send and get signal at higher speed without meddling different signs like radio waves.

2) Microcontroller PIC16F887:

This PIC-'Fringe Interface Controller' uses RISC (Decreased Instruction Set Computing). Because of this an extremely set number of guidelines should be learnt. Because of this it gives higher execution expanded velocity. The controller utilized as a part of the User man's gadget is utilized to control the fringe interfaced gadgets like the voice synthesizer, GPS, and the Speech acknowledgment framework. The coding is done utilizing inserted C dialect and Hi-Tech C compiler.

3) Microphone

This gadget is utilized to stand up the wanted area by the Client individual which is then given as a data to discourse acknowledgment framework.

4) Speech Acknowledgment Framework HM2007

The data given by the client is perceived by the discourse acknowledgment framework. HM2007 can record up to 40 words in a single chip. The destinations are pre-recorded by the client since its speaker dependant chip. Be that as it may, in need to spare more areas outer SRAM can be associated with the chip. Hence the chip recognizes the area and stores in the controller memory. The Output of the discourse acknowledgment unit serves as info to the controller. The upside of utilizing this chip is that the areas can be effortlessly deleted and nourished with another arrangement of areas. Additionally, the receivers can be straightforwardly associated with the chip.

5) GPS 634R

GPS (Global Positioning System) module is interfaced with the controller with a specific end goal to track the area where the transport goes. It has 65 stations to procure and track satellites at the same time and moving them into the exact position and timing data that can be perused over either UART port or RS232 serial port In this, the controller structures the heart of the working of the framework. The area beforehand talked by the speaker that is put away in the PIC memory is contrasted and the present area distinguished by the GPS module. In the event that after correlation the areas coordinate then the User individual is told and frightened.

6) Voice Synthesizer APR9600:

The APR9600is utilized as a part of request to tell the User individual with respect to area he needs to get down . This is finished by interfacing the yield of microcontroller as info to the synthesizer. The yield of this module is then given to the headset of the client which declares/tells him to get down at the craved stop. The yield of controller is only the two Inputs of the GPS module and the Speech recognizer. The area in

this manner recognized as a consequence of these two inputs is given to voice synthesizer. This gadget offers genuine single chip voice recording, nonvolatile capacity, and play-back ability for 40-60 seconds.Thegadget bolsters both arbitrary and consecutive access of various messages. It has low power utilization with a run of the mill working current of 25mA. It is likewise an easy to understand gadget with no programming and advancement frameworks required.

III. BLOCK DIAGRAM
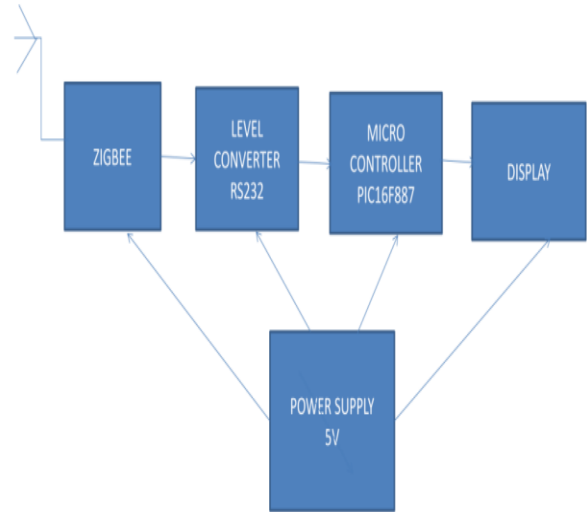
Functional Block Diagram of Bus Unit
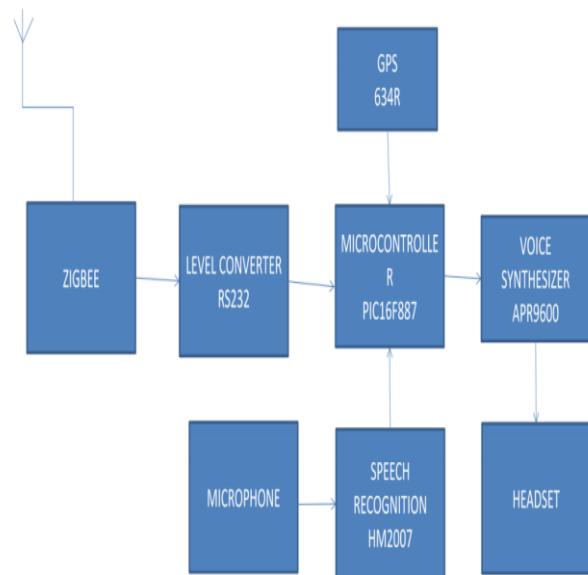
Passenger Unit

IV. CONCLUSION

Client can travel free of some other persons help. The route framework is anything but difficult to work for the blinds and the ignorant people. Ongoing interface of the Global Positioning Framework (GPS) module helps in following the individual at each and each time occasion. The traveler transport ready framework does not just limit to Blind individuals, it can likewise be utilized by the typical individuals for getting the transport subtle elements to achieve their destination. The whole framework is extremely financially savvy and every one of the modules are anything but difficult to handle. The information from the client to the voice acknowledgment framework ought to be boisterous and clear for it to translate it. The framework is not dialect perfect. Both the transport unit and the client unit ought to be in the ZigBee range from great data of the transport number and their last destination. This is an exceptionally helpful gadget that can be utilized by anybody. In future, the utilization of this framework can rearrange the going of numerous individuals. Additionally to make it savvy, Raspberry Pi can be utilized which will decrease the interfacing and costing of the gadget.

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