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Blind People Guiding Systemin Travelling

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ABSTRACT: Talking signs, guide cane, echolocations are all useful in navigating the visually challenged people to reach their destination, but the main objective is not reached that it fails to join them with traffic. In this project we propose a bus system using wireless sensor networks (WSNs).The blind people in the bus station is provided with a bluetooth unit which is recognized by the Bluetooth in the bus and the indication is made in the bus that the blind people is present in the station. So the bus stops at the particular station. The desired bus that the blind want to take is notified to him with the help of speech recognition system Bluetooth voice app in mobile. The blind gives the input about the place he has to reach using microphones and the voice recognition system recognizes it .The input is then analyzed by the microcontroller which generates the bus numbers corresponding to the location provided by the blind.
.

KEYWORDS: Arm7 Microcontroller, Bluetooth Module, Voice Play Back Module.

I. INTRODUCTION

This system has two main parts. First part is blind people recognition. Another part is communication between a bus and bus station. Blind people recognition part is constructed simple device and system. This part decides existing or non-existing of the blind at bus station[1].The objective of this research is to integrate an RFID (Radio Frequency Identification) readerinto aWireless Sensor Network (WSN) to authorize or keep track of people carrying RFID tags. The objectivewas accomplished by integrating hardware and software. The hardware consisted of two WSN nodes –the RFID node connected to one of the WSN nodes, and a computer connected to the other WSN node[2]. The visually impaired are particularly concerned, because of their need to detect and avoid obstacles, as well as to orient themselves in unknown environments.

In this paper, we discuss some existing projects in this domain and we propose a novel aid system formed of wireless sensors, meant to help navigation of the visually impaired, which addresses both orientation and obstacle negotiation [4].A location and tracking system becomes very important to our future world of pervasive computing, where information is all around us. Location is one of the most needed information for emerging and future applications. Since the public use of GPS satellite is allowed, several state-of-the-art devices become part of our life, e.g. a car navigator and a mobile phone with a built-in GPS receiver. However, location information for indoor environments is still very limited. Several techniques are proposed to get location information in buildings such as using a radio signal triangulation, a radio signal (beacon) emitter, or signal fingerprinting. Using radio frequency identification (RFID) tags is a new way of giving location information to users [5].The vision of pervasive computing is based on the idea that computers merge with their environment. Radio frequency identification (RFID) and wireless sensor network (WSN) are two important components of pervasive computing, since both technologies can be used for coupling the physical and the virtual world. However, RFID and WSN almost are under development in parallel method, few integration schemes and related opportunities are investigated in detail[6]. This paper describes the indoor navigation system and the customizable user interface[8].ZigBee is an IEEE802.15.4 standard for data communications with business and consumer devices. It is designed around low-powerconsumptionallowingbatteries to essentially last forever. The ZigBee standard provides network, security, and application [9].GPS is employed to find the position of the user on the earth. This information is provided by the GPS with the help of the data it receives from the satellite.GPSbasedvoice alert system for the blind uses the current location and gives the alert to the blind man[10].

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Literature Survey:-

In existing system the blind people in the bus station is provided with a ZigBee unit which is recognized by the ZigBee in the bus and the indication is made in the bus that the blind people is present in the station. So the bus stops at the particular station. The desired bus that the blind want to take is notified to him with the help of speech recognition system HM2007. The blind gives the input about the place he has to reach using microphones and the voice recognition system recognizes it .The input is then analyzed by the microcontroller which generates the bus numbers corresponding to the location provided by the blind. These bus numbers are converted into audio output using the voice synthesizer APR 9600. The ZigBeetransceiver in the bus sends the bus number to the transceiver with the blind and the bus number is announced to the blind through the headphones. The blind takes the right bus parked in front of him and when the destination is reached it is announced

II. PROPOSED SYSTEM

Here in this proposed system we are developed by new technology using bluetooth, this module easily transfer the data to bus unit section, each person having the mobile. In this we install the bluetooth application blind person easily know the bus location at that bus stop and in this application we are giving the voice signal to identify the bus stop location by using the voice announcement section in bus section, when blind person give a command by using bluetooth application in your mobile, mobile transfer the data to driver unit this section display the bus stop number and driver unit announce the bus stop name by using voice module .

Block Diagram:

Fig-1: Blind People Section

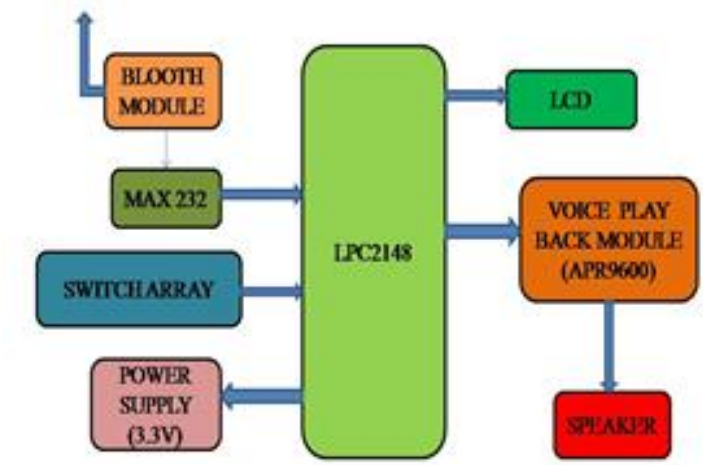

Fig- 2: Bus Section

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III. HARDWARE DESCRIPTION

A.Blind People Section

All smart phones contain bluetoothtransceiver section. This communication protocol used inourtransmitter section. In Google play store contain arm voice recognition application. This application convert voice to text transmission, it generate text data sends to bus section using bluetooth protocol.

B. Bus Section:

Bluetooth module (HC-05)

Bluetooth is a technology for wireless communication. It is designed to replace cable connections. Usually, it connects small devices like mobile phones, PDAs and TVs using a short-range wireless connection. And it uses the 2.45 GHz frequency band. The connection can be point-to-point or multipoint where the maximum range is 10 meters. The transfer rate of the data is 1Mbps (or a maximum of 2Mbps). It is a class-2 bluetooth module with serial profile that can be used as Master or Slave. We will use serial communication for various purposes.Since it also supports serial communication and you can treat it as a replacement.

HC-05 Specifications:

- 2.45Ghz Frequency
- Asynchronous Speed 2.1Mbps (max) .160Kbps
- Security: Authentication
- Profile: Bluetooth Serial Port
- Power Supply: +3.3 VDc
- Working Temperature:>20C
- Cost : Around INR 300

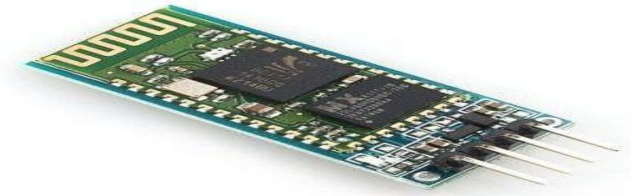

Fig-3: Bluetooth module (HC-05)

HC-05 Description:

We have six (or four) leads in this module. But we will genuinely care about only four of them. Where, the two are for Vcc and GND.**Vcc**= Power Supply (in other words 5V or 3.3V)**GND**= Ground (in other words 0 volt)And the next two leads are for RX (Receiving End) and TX (Transmitting End). From the basic idea, we can say the RX of the module will go to the TX of the ARM7. In the same way, we connect the TX of the module with the RX of the ARM7.

LPC2148 ARM Microcontroller:

The LPC2148 microcontrollers is based on a 16-bit/32-bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combine the microcontroller with embedded high-speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty. Due to their tiny size and low power consumption, LPC2148 are ideal for

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applications where miniaturization is a key requirement, such as access control and point-of-sale. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8 kB up to 40 kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit ADC(s), 10-bit DAC, PWM channels and 45 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers suitable for industrial control and medical systems.

Max232:

A standard serial interface for PC, RS232C, requires negative logic, i.e., logic 1 is -3V to -12V and logic 0 is +3V to +12V. To convert TTL logic, say, TxD and RxD pins of the microcontroller thus need a converter chip. A MAX232 chip has long been using in many microcontrollers boards. It is a dual RS232 receiver / transmitter that meets all RS232 specifications while using only +5V power supply. It has two onboard charge pump voltage converters which generate +10V to -10V power supplies from a single 5V supply. It has four level translators, two of which are RS232 transmitters that convert TTL/CMOS input levels into +9V RS232 outputs. The other two level translators are RS232 receivers that convert RS232 input to 5V.

Voice playback module (APR9600):

This technology enables the APR9600 device to reproduce voice signals in their natural form. It eliminates the need for encoding and compression, which often introduce distortion.APR9600block diagram is included in order to describe the device's internal architecture. At the left hand side of thediagram are the analog inputs.
A differential microphone amplifier, including integrated AGC, is included on-chip for applications requiring use. The amplified microphone signals fed into the device by connecting the ANA_OUT pin to the ANA_IN pin through an external DC blocking capacitor. Recording can be fed directly into the ANA_IN pin through a DC blocking capacitor, however, the connection between ANA_IN and ANA_OUT is still required for playback. The next block encountered by the input signal is the internal anti-aliasing filter. The filter automatically adjusts its response according to the sampling frequency selected so Shannon's Sampling Theorem is satisfied.

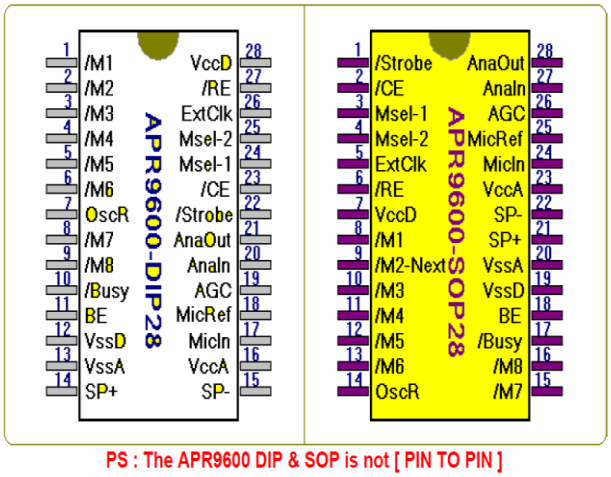

Fig-4: Voice playback module (APR9600*)*

After anti-aliasing filtering is accomplished the signal is ready to be clocked into the memory array. This storage is accomplished through a combination of the Sample and Hold circuit and the Analog Write/Read circuit. These circuits are clocked by either the Internal Oscillator or an external clock source. When playback is desired the previously stored recording is retrievedfrom memory, low pass filtered, and amplified as shown on the right hand side of the diagram. The signal can be heard by connecting a speaker to the SP+ and SP- pins. Chip-wide management is accomplished

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through the device controlblock shown in the upper right hand corner. Message management is provided through the message control blockrepresented in the lower center of the block diagram. More detail on actual device application can be found in the sampleapplication section. More detail on sampling control can be found in the Sample Rate and Voice Quality section.Moredetail on Message management and device control can be found in the Message Management section.

LCD:

A liquid crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

Communication Protocol:

Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHFradio waves in the ISM band from 2.4 to 2.485 GHz[4]from fixed and mobile devices, and building personal area networks (PANs). Bluetooth is managed by the Bluetooth Special Interest Group (SIG), which has more than 25,000 member companies in the areas of telecommunication, computing, networking, and consumer electronics.[6] The IEEE standardized Bluetooth as IEEE 802.15.1, but no longer maintains the standard. Bluetooth protocol stacksmain articles: Bluetooth stack and Bluetooth protocols.

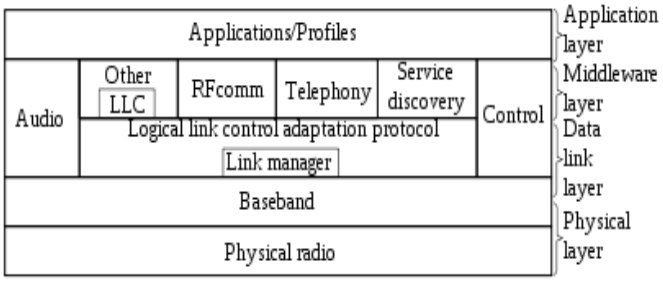

Fig-5: Bluetooth Protocol Stack

Bluetooth is defined as a layer protocol architecture consisting of core protocols, cable replacement protocols, telephony control protocols, and adopted protocols. Mandatory protocols for all Bluetooth stacks are: LMP, L2CAP and SDP. In addition, devices that communicate with Bluetooth almost universally can use these protocols.

LMPT:

The Link Management Protocol (LMP) is used for set-up and control of the radio link between two devices. Implemented on the controller.

L2CAP:

The Logical Link Control and Adaptation Protocol (L2CAP) Used to multiplex multiple logical connections between two devices using different higher level protocols. Provides segmentation and reassembly of on-air packets.In Basic mode, L2CAP provides packets with a payload configurable up to 64 kB, with 672 bytes as the default MTU, and 48 bytes as the minimum mandatory supported MTU.In Retransmission and Flow Control modes, L2CAP can be configured either for isochronous data or reliable data per channel by performing retransmissions and CRC checks.Bluetooth Core Specification Addendum 1 adds two additional L2CAP modes to the core specification. These modes effectively deprecate original Retransmission and Flow Control modes:

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Enhanced Retransmission Mode (ERTM):
This mode is an improved version of the original retransmission mode. This mode provides a reliable L2CAP channel.
Streaming Mode (SM):
This is a very simple mode, with no retransmission or flow control. This mode provides an unreliable L2CAP channel.
Reliability in any of these modes is optionally and/or additionally guaranteed by the lower layer Bluetooth BDR/EDR air interface by configuring the number of retransmissions and flush timeout (time after which the radio flushes packets). In-order sequencing is guaranteed by the lower layer. Only L2CAP channels configured in ERTM or SM may be operated over AMP logical links.

SDP:

The Service Discovery Protocol (SDP) allows a device to discover services offered by other devices, and their associated parameters. For example, when you use a mobile phone with a Bluetooth headset, the phone uses SDP to determine which Bluetooth profiles the headset can use (Headset Profile, Hands Free Profile, Advanced Audio Distribution Profile (A2DP) etc.) and the protocol multiplexer settings needed for the phone to connect to the headset using each of them. Each service is identified by a Universally Unique Identifier (UUID), with official services (Bluetooth).

IV. PROPOSED ALGORITHM

Algorithm for the proposed system is divided in two parts as

- Blind people section.
- Bus section.

A. Blind People Section:

Algorithm for transmitter side which consists of smart phone.Voice recognition application.
1. Initialize Bluetooth application
2. Search available Bluetooth devices.
3. Pair to bus device, send user commends to bus section

B. Bus Section:

Algorithm for receiver side which consists output
Devices, ARM7.bluetooth module, voice play back module.

1. Initialize SPI (Serial Peripheral Interface).
2. Initialize LCD.
3. Initialize voice play back module.
4. If anyserial commend received from user section then display “station number” else goesto step 5.
5. If anyserial commend not received from user sectiondisplay “initial display” else go to step 6.
6. Then identify number and find bus station number and trigger voice playback module. Else go to step4.

Circuit Diagram:

Here in this circuit wehave interfacing the lcd and serial communication with microcontroller(lpc2148).here we connect all components. The blind gives the input about the place he has to reach using microphones and the voice recognition system recognizes it.

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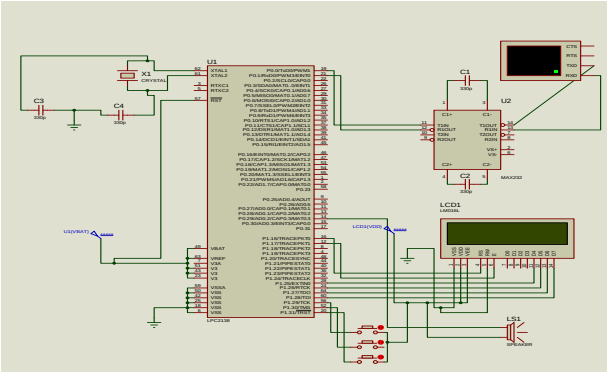

Fig-5: Circuit diagram

The input is then analyzed by the microcontroller which generates the bus numbers corresponding to the location provided by the blind.

V. WORKING MODEL AND TESTRESULTS

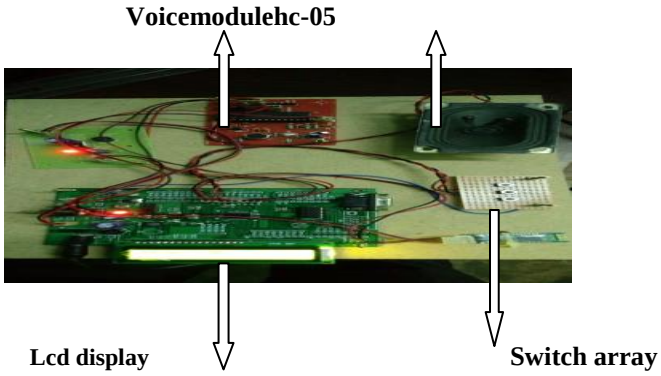

Fig-6: Bus Side receiving Section

TheFig-6.shows the modules to be placed in Bus receiver side which consists output Devices, ARM7,bluetoothmodule, voice play back module. Initialize SPI, LCD,voiceplay back module. A serial command will be received from blind people section, which is displayed on LCD.

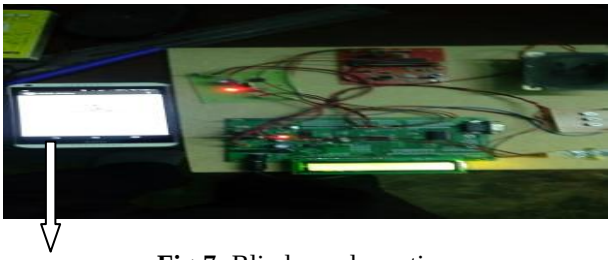

Fig-7: Blind people section

Smart phone

The transmitter side which consists ofsmart phone, Voice recognition application is present which are shown in Fig.7.

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The steps to operate the device at blind person section are
1. Initialize Bluetooth application
2. Search available Bluetooth devices.
3. Pair to bus device, send user commends to bus section.

Fig-8: User commends result1

If any serial commend received from user section display "initial display-STOP A" then identify number and find bus station number as shown in Fig.8. And trigger voice playback module.

Fig-9: User commends result2

in this section(Fig.9), If any serial commend not received from user section display "initial display-STOP B" then identify number and find bus station number. And trigger voice playback module.

VI. CONCLUSION

This device is designed to provide with a greater advantage producing voice based announcement for the user i.e. the user gets the voice which pronounces his bus details as and reaches the destination. Here instead of the alerting sound the user can directly hear the location recorded by the user itself. This provides information that would be needed in an emergency situation to direct emergency officials, or to phone for help when lost Assists in familiarizing with a new environment. To remove the chances of errors in finding exact location this uses RFID technology, active tags at each and every bus stops to intimate the blind people exactly where there are.

Future Scope:

This prototype to assist the Visionless people while boarding the bus has wide applications other than just helping the blind people inform their presence to the bus driver. In further stages of development this project can be used to enhance the safety and comfort of a larger section of society. Following are some of the anticipated future scopes:
1. This system can be installed over the taxies and not just public buses, all over the city so that people can very easily communicate with them.
2. This system, if manufactured commercially, is very economic and thus can be made available at the stores so that women, children, senior citizens or any section of society can use it.
3. With few changes in the hardware and programming, this prototype can be turned into a security device. Women may have this all the time with them while they are out of their homes. Each policeman will also be handed over one device. So whenever any woman feels any kind of danger, whether she is having network in her mobile phone or not, she can instantly switch on her device, so that any policemen in that area will know andshe can be rescued. Looking towards the present Scenario of the nation, this device can be proved to be very useful, as far as women security is concerned.

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REFERENCES

[1] Baudoin G, Sayah J, Venard O, Hassan B. Simulation using OMNet++ of the RAMPE systeman Interactive Auditive.Machine helping blinds in Public Transports, EUROCON, Belgrade 2005; 1-5.
[2] Torres B, Pang Q. Integration of an RFID reader to a Wireless sensor network and its use to Identify an individualcarrying RFID tag. International Journal of ad hoc. sensor& ubiquitous computing 2010; 4: 1-15.
[3] Perry BD, Morris S, Carcieri S. RFID Technology to Aid in Navigation and Organization for the Blind and PartiallySighted, 2009; 1-52.
[4] Guyennet H, Beydoun K, Felea V. Wireless sensor network system helping navigation of the visually impaired, IEEE.international conference on Information and Communication Technologies: from Theory to Applications, version 1,2011; 1-5.
[5] Jack Loomis M, Roberta Klatzky L. Navigation System for Blind, Massachusetts Institute of Technology 2008; 7(2):193-203.
[6] Jain PC, Vijaygopalan KP. RFID and Wireless Sensor Networks', Proceedings of ASCNT, CDAC, Noida, India,2010; 1-11.
[7] Ho L, Moh M, Moh T-S, Walker Z. A Prototype on RFID and Sensor Networks for Elder Health Care, Taylor &Francis Group, LLC, 2007; 314-317.
[8] Mishra R, Koley S. Voice Operated Outdoor Navigation System For Visually Impaired Persons. International Journalof Engineering and Technology 2012; 3(2): l53-157.
[9] RiazAhamed SS. The Role of ZigBee Technology In Future Data Communication System. Journal of Theoreticaland Applied Information Technology, India, 2009; 129-134.
[10] Gulati R. GPS Based Voice Alert System for the Blind. International Journal of Scientific and Engineering Research2011; 2(1): 1-5.

BIOGRAPHY

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Suresh Veesa, has received B.Tech. degree in Electronics and Communication Engineering from Jawaharlal Nehru Technological University, Kakinada, India in 2010 and the M.Tech degree in Communications from the Department of Electronics and Communication Engineering, JNT University, Kakinada, AndhraPradesh,Indiain 2015.Researchinterests:Optical Communication

Balamuralikrishna Potti is a Professor at Sri Mittapalli Institute of Technology for Women, Guntur, India. He has 15 years of teaching and 4 years of research experience. He received B.E. degree in Electronics and Communication Engineering from Andhra University, India in 2001 andM.Tech. degree in Instrumentation and control systems from JNTU College of Engineering, Kakinada in 2008.He had guided 8 M.Tech projects and 20 B.Tech projects. He has published several papers in International Journals and conferences. He attended 15 workshops / short-term courses. His areas of interest are Computer Networks, Communications, Image processing, Signal processing and Instrumentation. He is a life member in ISTE and IETE