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Earlier Bus Detection with Voice Message for Blind People Using RFID

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ABSTRACT: A bus detection system using RFID technology is presented in the proposed work that aims to ease the traveling and movement of blind people. The proposed system consists of two detection subsystems, one on the buses and the other on the bus stations, database system and a website. In the bus detection subsystem, the nearby stations will be easily detected and then announced through a voice message inside the bus. Moreover, any existing blind person in the surrounding area of the station will be detected by the bus subsystem to alert the bus driver about the number of blind persons. In the bus station subsystem, the coming buses will be detected and then announced in the station in order to alert the blind people. A complete system prototype has been constructed and tested to validate the proposed system. The archived results show that the system performance is promising in terms of system functionality, safety, and cost.

KEYWORDS: Arduino Uno R3 Microcontroller, RFIDTAG, LCD, Vibration sensor, RFID Reader, ATMEGA328

I.INTRODUCTION

Blind people are desperately in need of special requirements and services including the public transportation to give them the rights and ability to move smoothly and independently from one place to another. One of the requirements for ease and comfort in enjoying life is the ability to move independently from one place to another using different possible ways such as on feet, cars, metro etc. However, not everybody can simply depend on his own in travelling like some categories of disabled people. One of these disabilities is blindness, where this category of the society faces many problems in mobility. In addition, blindness limits the type of transportation a person can use as well as the delay resulted from using such transportation systems. The most used transport means for blind people is the public transportation which is considered as one of the important means for travelling in many countries.

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Unfortunately, public transportation is not an easy mean to use and access by blind people in many countries. For example, in the case of buses, blind people have difficulty in recognizing and estimating the arrival of buses at the bus stations. Moreover, they cannot read the bus number to identify the correct bus to board. Unlike normal people who travel independently, blind people need support in guiding them continuously to avoid accidents as well as the unacceptable lateness in their appointments and meetings which may affect their performance as active members in the society. Furthermore, the difficulty of using the public transportation by blind people will make them more isolated and unable to live their normal life. There are systems that had been engineered for assisting blind and visually impaired

A system to help blind people to travel smoothly and independently from one place to another by providing complete and clear information about the following: the existence of blind people at the bus station to alert the bus driver, the approaching bus station, and the buses arrival and their routes at a bus station. Our project aims to present a technology automatically detecting the accident and a hardware tracking device based on GSM/GPS technology informing at the occurrence of accident with sufficient details like exact location and time at which accident happened. This project will establish a communication between the control station and the unit installed in vehicles. Vehicles will have GPS/GSM enabled tracking modules and will be tracked in real time using cellular networks.

II.PROPOSED METHOD

The proposed system consists of two subsystems: a bus subsystem and a station subsystem. They are both connected to a database. The two subsystems are used to detect the arrival of buses, approaching bus stations, and blind people in the station. Both the bus station and the bus itself have RFID tag and RFID reader. Moreover, each blind person in the station has a tag that linked to relevant travel details (e.g. destination, bus number, etc...) via the system database. This information is inserted in the database during the ticketing process. Two separate announcement systems are used in this design; one in the bus station to announce the arrival of buses and the other in the bus to announce the coming stations that are in the bus route. In addition, the bus driver will be provided with information about blind people who need the bus. The system enables the bus driver to know the number of blind people that need the bus and their required destinations. This ensures that the bus driver give special attention to blind people and wait until he is sure that all blind persons get into the bus. The bus subsystem will have a central announcement system to inform all passengers in the bus about the coming stations in order to alert bus passengers as well as blind people. This will meet our requirement that the system benefits other passengers besides the blind people The station subsystem will have a central announcement system about the buses arrival so that all passengers get benefit from this feature

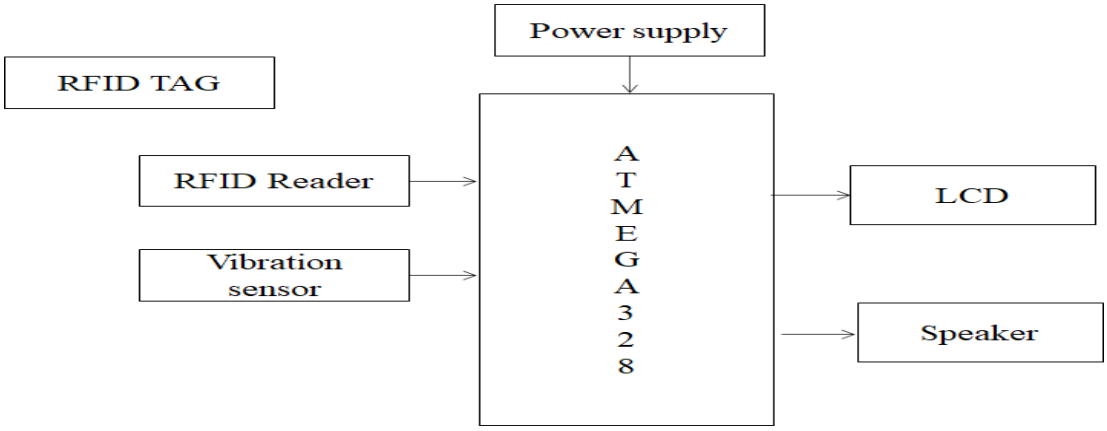

Fig 1. Block Diagram of Proposed Method

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Arduino is a computer hardware and software company, project, and user community that designs and manufactures microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU (LGPL) or the (GPL), permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, kits.

IV.HARDWARE REQUIREMENTS

The Arduino Uno R3 is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. Revision 2 of the Uno board (A000046) has a resistor pulling the 8U2 HWB

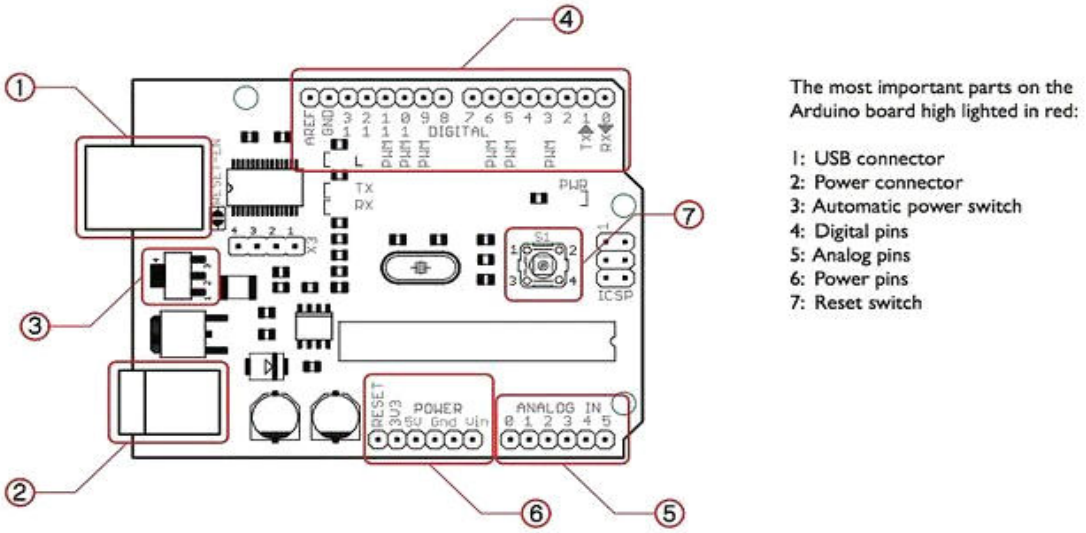

Fig 2. ARDUINO UNO R3 Microcontroller

DFU Mode

Revision 3 of the board (A000066) has the following new features:

- 1.0 pin out: added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage provided from the board. In future, shields will be compatible with both the board that uses the AVR, which operates with 5V and with the Arduino Due that operates with 3.3V. The second one is a not connected pin, that is reserved for future purposes.
- Stronger RESET circuit.
- At mega 16U2 replace the 8U2.

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V.SIMULATION RESULTS

Amplifying a digital signal, switching a large amount of power with a small operating power. Some special cases are: A telegraph relay, repeating a weak signal received at the end of a long wire Controlling a high-voltage circuit with a low-voltage signal, as in some types of modems or audio amplifiers

STEP:1

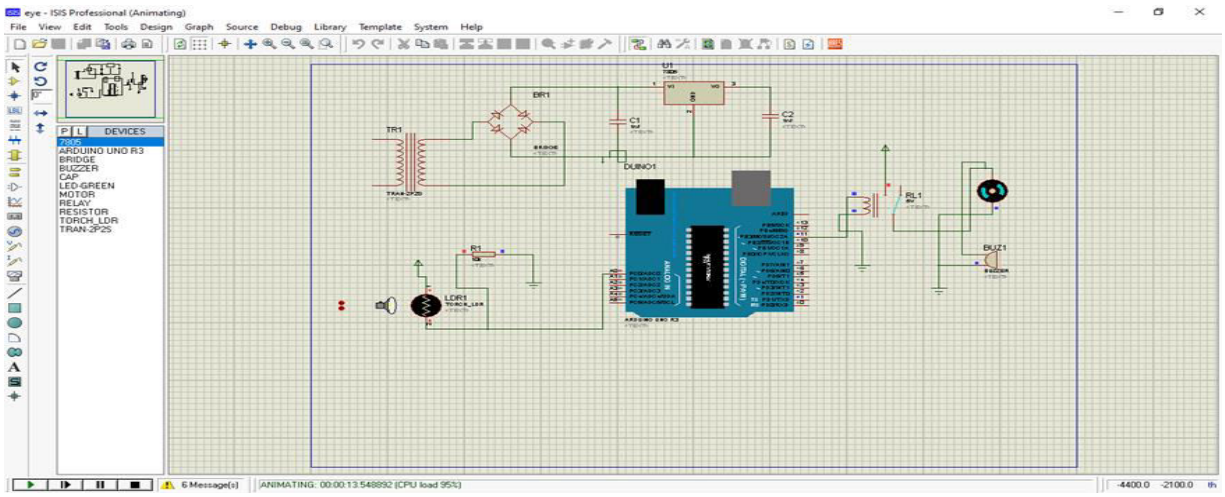

Fig 3. Simulation for detect the bus

STEP:2

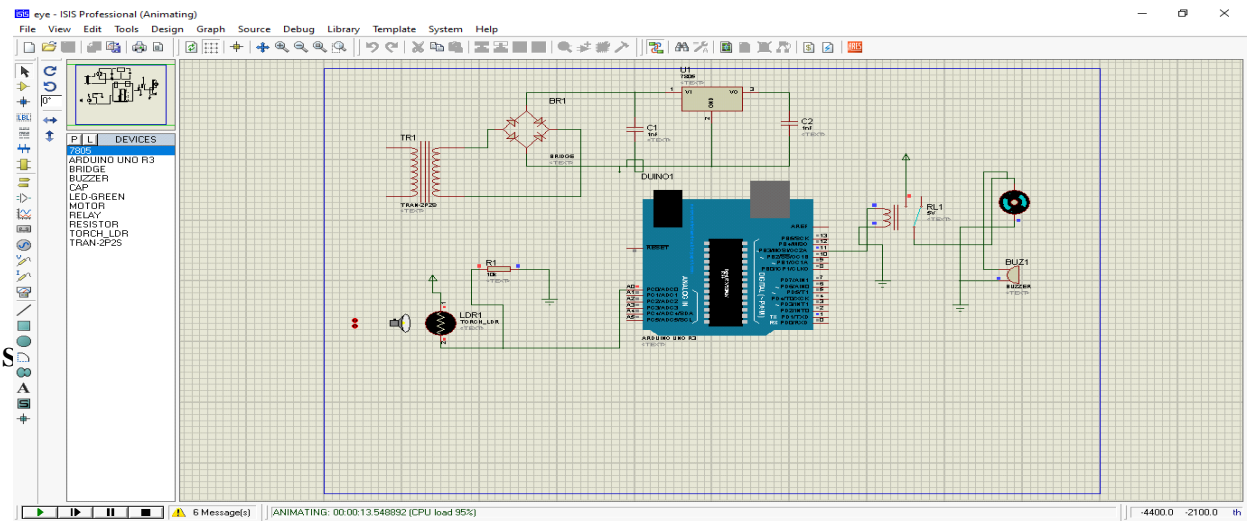

Fig 4.Alert the Blind People

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VI.CONCLUSION

The estimated number of blind people over the world is between 40 to 45 million, special services should be provided to them in order to give them the right to live as others does. In this paper, a bus detection system for blind people using RFID is presented. The proposed system is easy and provides a convenient service for all the passengers; not only the blind ones. The system has two subsystems which are: the bus subsystem and the station subsystem. Bus subsystem announces the coming stations in the bus route for all passengers. Moreover, the bus driver will be provided with the number of blind people who required the bus and their destinations. The station subsystem will give announcement of the approaching buses. A prototype of the proposed system was successfully built and tested. Our design is promising in terms of its performance and functionality.

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