

DEVELOPMENT OF ELECTRONIC STICK FOR BLIND WITH PANIC BUTTON

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ABSTRACT

Nowadays the blind and impaired people are suffering a lot because there are so many struggles for blind peoples to reach their destination and also there are dangerous risks that blind persons must face. To avoid uncomfortable walking experience, we have designed a smart electronic walking stick for blind people. Our project proposes a low-cost walking stick based on latest technology and a new implementation is made for efficient interface for blind people. Basically, the ultrasonic sensor is implemented in the walking stick for detecting the obstacles in front of the blind/impaired persons.

If there are any obstacles, it will alert the blind person to avoid that obstacles and the alert in the form of buzzer. In a daily life there are different aspects in order to provide flexible and safe movement for the blind people. In this technology driven world, where people strive to live independently, this project propose a low-cost ultrasonic stick for blind people to gain personal independence, so that they can

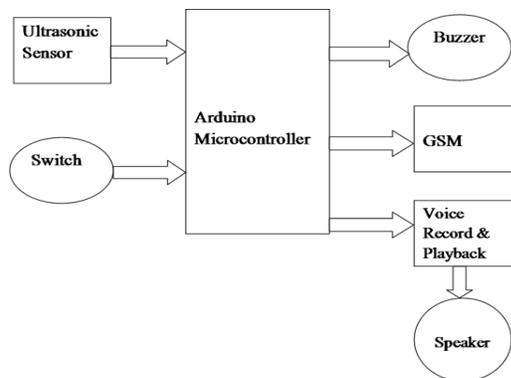
move from one place to another easily and safely. A portable stick is design and developed that detects the obstacles in the path of the blind using ultrasonic sensors. The buzzer and vibration motor are activated when any obstacle is detected. In addition, the stick is equipped with GSM for sending the information regarding the blind person to his family members.

INTRODUCTION

Independence is the important methodology in achieving objectives, dreams and goals in life. Visually impaired/blind persons find themselves challenging the dangerous paths to go out independently. There are millions of visually impaired or blind people in this world who are always need the help from others. From many years the normal walking stick became a well-known attribute to blind person's navigation and later efforts have been made to improve the walking stick by adding remote sensor. Blind people have big problem when they walk on the street or stairs using normal walking stick, but they have sharp haptic sensitivity. The electronic walking stick will help the blind person by

providing more efficient and convenient means of life.

Moving through an unknown environment becomes a real challenge for the blind or impaired people. Those who go out from the house with the white stick, often use well-known routes and difficulties with new ones. Moreover, many people simply afraid of being helpless in constant movement of people, vehicle and other road users. It is therefore advisable to offer new solutions of the problems with existing technologies. This project proposes the design and develops a portable stick for a blind/impaired people for convenient use and navigation in public and private places.



EMBEDDED SYSTEMS

An embedded system is a special-purpose computer system designed to perform one or few dedicated functions, sometimes with real-time computing constraints. It is usually embedded as part of a complete device including hardware and mechanical parts. In contrast, a general-purpose computer, such

as personal computer can do many different tasks depending on programming. Embedded systems have become very important today as they control any of the command devices we use. Since the embedded system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product or increasing the reliability and performance.

Some embedded systems are mass-produced, benefiting from economies of scale. Physically embedded systems ranges from portable devices such as digital watches, MP3 players to large stationary installations like traffic lights, factory controllers or the systems controlling nuclear power plants. Complexity varies from low with a single microcontroller chip to a very high with multiple units, peripherals and networks mounted inside a large enclosure.

In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems — such as the operating systems and microprocessors which power them — but are not truly embedded systems, because they allow different applications to be load and peripherals to be connected.

An embedded system is some combination of computer hardware and software, either fixed in capability or programmable that is specifically designed

for a particular kind of application device. Industrial machines, automobiles, medical equipment, cameras, household appliances, airplanes, vending machines, and toys (as well as the more obvious cellular phone and PDA) are among the myriad possible hosts of an embedded system. Embedded systems that are programmable are provided with an interface embedded programming is a specialized occupation. Certain operating systems or language platforms are tailored for the embedded market, such as Embedded Java and Windows XP Embedded. However, some low-end consumer products use very inexpensive microprocessors and limited storage, with the application and operating system both part of a single program. The program is written permanently into the system's memory in this case, rather than being loaded into RAM (random access memory), as programs on a personal computer are.

HARDWARE COMPONENTS

Transformer is a static device used to convert the voltage from one level to another level without change its frequency. There are two types of transformers

1. Step-up transformer
2. Step-down transformer

Step-up transformer convert low voltage level into high voltage level without change its frequency.

Step-down transformer convert high voltage level into low voltage level without change its frequency.

In this project we are using step-down transformer which converts 230V AC to 12V AC [or] 230V AC to 5V as shown below.

A voltage regulator is an electrical regulator designed to automatically maintain a constant voltage level. It may use an electromechanical mechanism, or passive or active electronic components. Depending on the design, it may be used to regulate one or more AC or DC voltages. There are two types of regulators

- Positive Voltage Series (78xx)
- Negative Voltage Series(79xx)

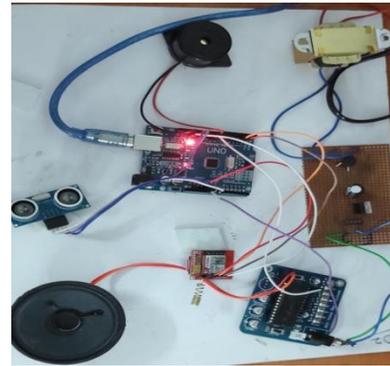
Modern security systems utilize various types of sensors to detect unauthorized object access attempts. The sensor collection includes infrared, microwave and ultrasound devices, which are intended to detect moving objects. Each type of sensor is characterized by its own advantages and drawbacks. Microwave sensors are effective in large apartments because micro waves

pass through dielectric materials. But these sensors consist of expensive super-high frequency components and their radiation is unhealthy for living organisms.

Infrared sensors are characterized by high sensitivity, low cost and are widely used. But, these sensors can generate false alarm signals if heating systems are active or temperature change speed exceeds some threshold level. Moreover, infrared sensors appreciably lose sensitivity if small insects penetrate the sensor lens. Ultrasound motion detection sensors are characterized by small power consumption, suitable cost and high sensitivity. That's it why this kind of sensor is commonly used in home, office and car security systems. Existing ultrasound sensors consist of multiple passive and active components are relatively complicated for production and testing. Sensors often times require a laborious tuning process.

The ultrasound transmitter TX is emitting ultrasound waves into sensor ambient space continuously. These waves are reflecting from various objects and are reaching ultrasound receiver RX. There is a constant interference figure if no moving objects are in the placement.

RESULT



CONCLUSION & FUTURE SCOPE

The Blind Walking Stick has been finally made into prototype that can be used to guide the blind. It aims to solve the problems faced by the blind people in their daily life. The system also takes the measure to ensure their safety. This project will help all the blind people in the world and will make it easier for them to walk. It was done to help the blind move ahead very well. It helps to facilitate the movement ensuring safety.

It should be noted at this stage that this work has been thoroughly carried out in order to design and implement an articulate walking bolt for the blind. The Smart Stick acts as a versatile interface for easy and comfortable internal and external mobility for visually impaired people in the next phase of more supportive apps. It's safe and affordable. This results in effective obstacle detection within three meters of the user's direction. It offers low cost, reliable, lightweight, low

power and efficient navigation with fast, quick response times. The computer is hardwired, but light weight, with sensors and other features. Wireless connectivity between components of the device will enhance the additional features of this instrument and increase the range of ultrasound sensors and incorporate technologies to measure the intensity of obstacles approaching. With this approach, our targets in all of the developing countries were particularly addressed towards visually impaired and blind people. In this analysis the machine built can only sense obstacles and humidity. Thus, ultrasonic sensor systems, Arduino Uno and other tools can be designed for an approach to warn users about the direction of movement by using audio commands.

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