THIRD VISION FOR BLIND: ULTRASONIC VIBRATOR GLOVE

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Abstract: In this high-tech era, technology has made it possible that everyone can live a comfortable life. But somehow the physically challenged people need to depend upon others in their daily life which ultimately makes them less confident in an unfamiliar environment. But nowadays the explosion of innovative technology provides many opportunities for them to live confidently without feeling as a burden. So, in this paper, an intelligent device is represented for visually challenged people to guide them to reach their destination place safely without facing any difficulties. It consists of Lily pad aurdino controller, along with sensors like Ultrasonic and other supportive sensors.
Keywords: Lily pad Aurdino, Vibrating motor, ultrasonic sensor, battery,Wires.

I. INTRODUCTION

In today's fast track world the physically disabled people are left soo unconcerned that at times they even undergo apathetic and indifferent behaviour by the so called normal people . They feel dependent on others could be their friends, family or a known person in a way for their every day routine chores. Eyes being a prime sense of organ in perceiving and looking the outside world making it more beautiful. Think about the dysfunction of this prime sense organ it could badly effect the knowledge adapting capability of the outside environment.

This The objective of this project " The Third Eye for the_Blind "is to design a product which is quite much of a use to the people who are visually impaired(blind or maybe with some disabilities with eyes) and for those on whom they often have to rely. Third eye for Blind would give independency and confidence by knowing the nearby obstacles using the help of the wear-able glove which would produce the ultrasonic waves that notify them with buzzing sound and vibrations. It allows the user generally the ones who are visually impaired to walk freely by detecting the objects amidst their way.

LilyPad-Arduino is chosen as the microcontroller for fulfilling the objective of designing a light-weight and economically affordable garment which is wearable and washable. The advantage being that when compared to all other Arduino boards it's compact in size. The system hardware is designed to detect obstacles within under a specific range set in the program which could be later changed. If the ultrasonic sensor detects objects , the vibrating motor would be switched on and would inform the blind about obstacles in path.

II. LITERATURE SURVEY

Now-a-days things has changed so much, now inventors have been paying attention to the health care technologies. Seeing the outdoor environments has became many people dreams. To help the visually impaired person researches have made some wearable technologies. Reference paper [1]: "Shoval et al. develloped the Navbelt, an obstacle avoiding wearable portable computer which was only for the purpose of indoor navigation. Navbelt was computer equipped with two modes, the system information was translated to audio in different sounds. There were two sounds produced one being the sound for free for travel direction and other sound for the blocked purpose, it became difficult for the person to differentiate between the sounds. Other problem was that system was not capable of knowing the user momentary position." Reference paper [2]: "Benjamin a laser cane with three photo diodes and three laser diodes function as receiver making an optical triangulation. The laser cane generally detects obstacle in three specified directions." Reference paper [3]: "Ms. IPooja Sharma has discussed about the obstacles detection and said that the obstacles can be detected, but it got many limitations on the angles and the distances about the obstacles. Thus on comparing this glove to others till now, this project will have a wide angles for the detections where the sensors ranges will be wide." Reference paper [4]: "IRaivat ILuthura and ISerkan Oztas from Nottingham university developed a glove named Sensei Glove consists with a Velcro attachment on top of which an ultrasonic sensor is fitted that uses vibration signals to alert blind people to the nearness of " Working Hardware system : System hardware design is a way to construct a model whose objective is to detect the hurdle or object in the specified range and whose range value can be set in the program. Sensors are placed to detect hurdle or objects in a path . Once they are found vibrating motor turns on along with the buzzer , allowing the person to take alternate path. As our objective is to prepare low weighted,

budget friendly model we prefer Lilypad Arduino for mircocontroller.A USB to Serial cable is used to connect lilypad to computer.For transmitting and recieving signals UART is used. LEDs are also connected on the board to show other peoples that the device is turned ON and it is working.All these equipments are connected on a perf board along with a battery to charge.

III. EXISTING SYSTEM

The present machine includes the gadgets or the helps like white cane for supporting them to detect the limitations and tour to places, , and smart gadgets like imaginative and prescient a torch for blinds. But, there were many obstacles and troubles on this present systems like withinside the white cane, it can without problems destroy or crack. The white cane may also get caught on the pavement cracks of the distinct objects. Whereas the price is massive and want a number of training.

IV. SYSTEM HARDWARE DESIGN

The system hardware is designed to detect objects within a specified range which is set in the programs. If the sensor detects obstacles, the vibrating motor will be switched on to inform the users allowing the users to take a different path. LilyPad Arduino is chosen for the microcontrollers as the objective is to design a light-weight, low budget garments which is wearable and washable. It also has a major advantages compared to other Arduino boards, a compact size. A USB to serial cable, or Arduino simple USB converter is required to connect the LilyPad to a computers. The communication protocols used with USB and LilyPads are different. Therefore, an extra chip is required to convert the signals to communicates. A common communications protocols among embedded electronics is called asynchronous serial protocol This protocol is used to communicate data with controllers and devices and is implemented by a devices, Universal Asynchronous Receivers/Transmitters (UART). A UART is a device which transmits data on "TRANSMISSION" line and receives data on an "RECEIVER" line when using the serial protocol to communicats. The LilyPad Future Technology Devices International (FTDI) USB to the serial connector boards has TX and RX LEDs. These turn on when the data is transmitted or received via USB cables and allow the programmer to verify the board is working . This connector is used to connects the LilyPad in order to program the prototypes. On the other hand, by reducing the USB communication protocol onto the extra chips, the LilyPad has a major advantages compared to other Arduino boards, a compact size. Additionally, it also has a physical power switches. When the LilyPad is connected to the computer, it is powered through a USB cable. There is a LED (above pin 5) which indicate the board is powered on. When the LilyPad is connected using a USB, it is always powered although the physical switchs is turned to off . As stated previously, the LilyPads has digital pins which are 5, 6, 9, 10 and 11. They have two modes, ONN and OFF. If they are on, there are 5 volts in them whereas 0 volts when off. Input devices such as sensors are connected to analogue pins. Obviously, digital pins can only measures on and off depending on 0 or 5 volts. The LilyPad vibe board is used as an output to alert the users. This motor is especially designed for a wearable technology, LilyPad Arduino. The outer diameter of the motor is only 20mm. However, it is a powerful and yet only wearer will know when it vibrates . The Polymer Lithium battery is used to power the LilyPads during testing. It is a very small and enormously light weight at only 2.65g It can be argued that 10 percentage efficiency loss or no efficiency losses is possible. In contrast, it is stated that the standard acceptance efficiency losses is 20 percentages.
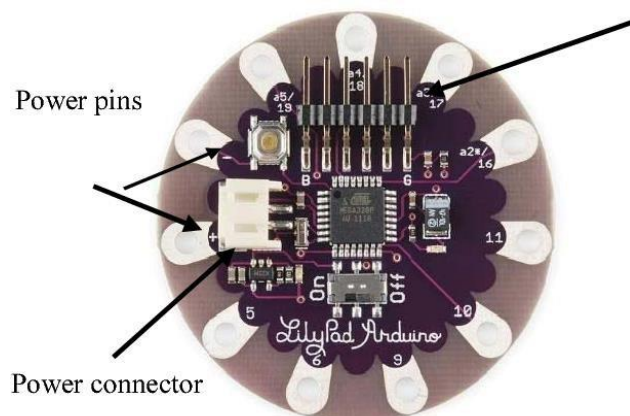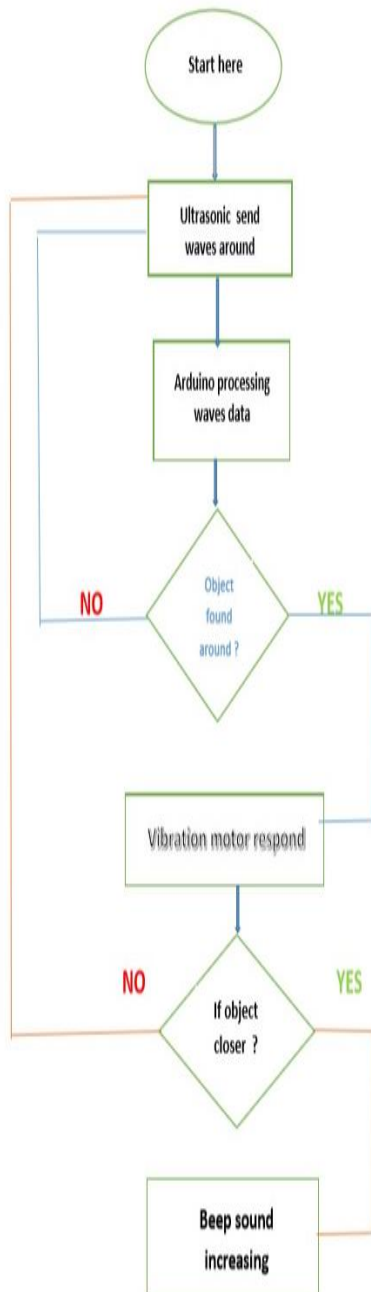

Fig. Lily pad Arduino simple board

BLOCK DIAGRAM

V. WORKING

This proposed system consists the above mentioned equipments and their connection in the following manner. The Ground of LED buzzer and vibration motor are attached to GND of the Arduino. The positive of the LED and the middle leg of switch is connected to the Arduino pin 5. The positive of the Buzzer is wired to the first leg of the switch and the positive of the Vibration motor is wired to the third leg of the switch . The US- ultrasonic sensor is a transducer which is used in pair as a trans-receiver. The transmitter emits the ULTRASONIC waves and if obstacles are present in the path then the Ultrasonic waves hits the obstacles and gets reflected back. The reflected wave is established by the receiver. The Utrasonic sensor is a combination set of one transmitter-receiver. The time gap between sending and receiving of the Utrasonic signals is calculated and evaluated and then this time interval is used to calculate the distance btween sensor and the object/obstacle.

Firstly the pref board is cut in required dimension and soldering of the female headers for the arduino to the board is done. Then soldering of buzzer is carried out next. Then using the glue we would connect the vibrating motor to the rest and solder the wires too making sure the soldering is proper. Then connection of the LED is what comes next. Then connect the switch and the header pins for US sensors and for the battery i/p. Then all the things are soldered and the arduino and ultrasonic sensor to the perfboard. Should be connected. Also one should connect the elastic band to every module required. For making the module(system to be attached) for the hand, connect the ULTRASONIC sensor to the board by use of cables. Connecting a battery to this module is the next step. Then connecting the elastic bands. At last after all the connections are done to the Arduino, upload the code to each arduino-board and power all the other modules using a power bank**.**

VI. FUTURE ENHANCEMENT

This technology will be became coat. By adding the specialised boards rather than arduino and mistreatment prime quality inaudible detector to provide a quicker response in huddled places and wearable technology which can simple to handle and economical in price. therefore this can be implimented in future enhancement of this glove.

VII. CONCLUSION

This project consist of a design of such a concept which we can term as a virtual eye for the people who are insufficient to detect obstacle with their naked eyes. It is an Aurdino based project which will be economical and affordable. This is a easy and effective portable glove that can identify hurdles in any way irrespective of its height and depth. It calculates distance between the user and the obstacle easily, and then according to its received back signal intensity, buzzer beeps and motor vibrates. If the design of this system is made with correctness then blind impaired person can go to easily in different directions

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