

Third Eye for Blind Ultrasonic Vibrator Gloves

Asst. Prof. Rakesh Narvey, Asst. Prof. Rahul Sagwal, Harshita Shakya, Nupur Bhardwaj,

Pooja Mandre, Neha Rajpoot

Department of Electrical Engineering
Madhav institute of Technology and Science, Gwalior

Abstract – In this paper we have researched on the ultrasonic vibrator gloves. This technology is implemented to help visually impaired in identify the objects that may come in their path within 1.5m in any direction of the glove. When the user of this gloves encounters an object within the range of 1.5m, the glove alerts the user with a beeping sound and vibrations. As soon as the user goes towards the object, intensity of beeping sound will increase. Advantage of this glove is its highly low manufacturing cost which is almost ten times lower than the other technologies are being made of the same purpose. The use of ultrasonic sensors and Arduino lilypad have heavy communications on the gloves, but with the help of other components effect of ultrasonic radiations can be reduced easily. By this, this project can be easy to wearable with less harms and economical in price can lighten up the markets by its features. The main aim was economizing this project so that even the financially weaker may use it.

Keywords– Blind person; Arduino; Ultrasonic sensor; Vibrating motor; Social impact; Wearable device; Independent; Obstacle; Language.

I. INTRODUCTION

In today's fast track world the physically disabled people are left so 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 REVIEW

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. developed 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 objects.” 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 microcontroller. A USB to Serial cable is used to connect lilypad to computer. For transmitting and receiving 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.

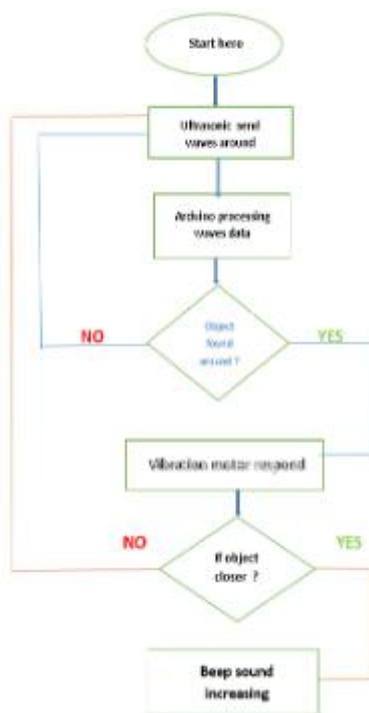


Fig.1. Block Diagram.

Software system: In software system programmes is being written in the Arduino board chips in its preferred language that is c or c++ language. Compile and install the program into microcontroller by using the software language. Then programme run and measures the distance

at which obstacles is placed and alerts the user by beeping. Programme is setup for the variables such as pin numbers or distances in the beginning of the software design. In the function named setup pin are defined the whether, they are input or output of the glove.

III. FUTURE ENHANCEMENT

This technology can be changed into coat. By adding the specialized boards instead of arduino and using high quality ultrasonic sensor to give a faster response in crowded places and wearable technology which will easy to handle and economical in price. Thus this will be implemented in future enhancement of this glove.

IV. 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.

REFERENCES

- [1]. Shraga Shovel, Iwane Ulrich, Navbelt and the guide cane, IEEE transactions on robotics and automation (2003)
- [2]. Benjamin, Ali NA a laser cane for the blind, proceedings of Sent Diego medical symposium, (1973)
- [3]. IPooja Sharma, Shimi SL, Chatterzee S. A review on obstacle detection and vision, International general of Engineering and Advanced technology, (2015)
- [4]. IRaivat Luthura and iSerkan Oztas, SenSei gloves created with a velcro attachment, Nottingham university, (2015).