



SMART GLASSES FOR BLIND

MINOR PROJECT PRESENTED BY TEAM HUSTLERS



MENTORED BY:

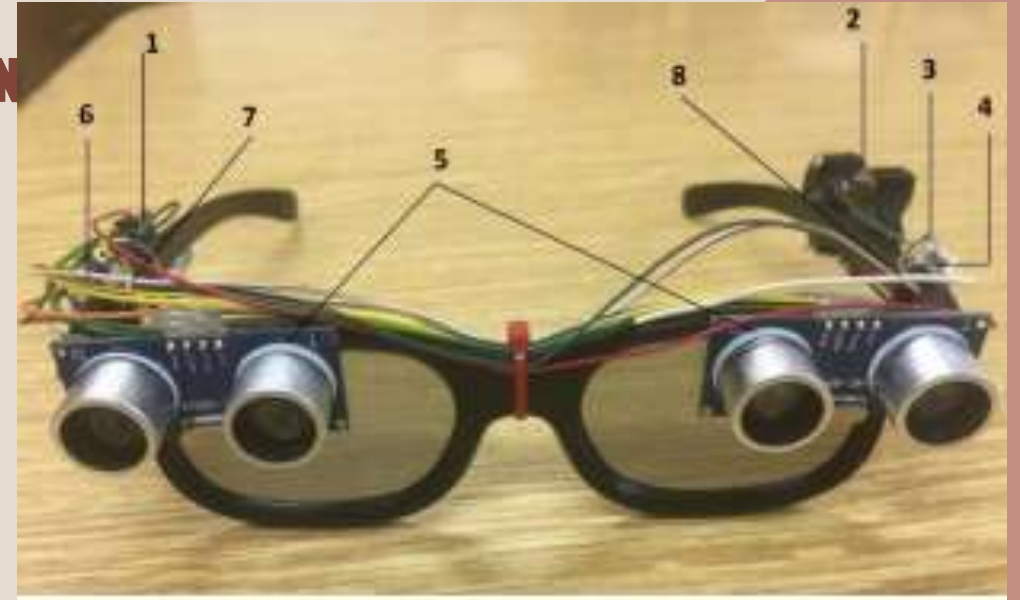
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CONTENTS

- **ABSTRACT**
- **INTRODUCTION**
- **OVERVIEW →**
 - **OBSTACLE DETECTION**
 - **OBSTACLE AVOIDANCE**
 - **PATH GUIDANCE**
- **COMPONENTS USED**
- **TECHNOLOGY USED IN PROJECT**
- **BENEFITS**
- **FUTURE RECOMMENDATION**
- **CONCLUSION**
- **TEAM DISTRIBUTION**



ABSTRACT

This paper introduces a wearable eyeglass with an ultrasonic sensor and camera module to help the blind to navigate alone safely, while avoiding obstacles that may be encountered, fixed or mobile, thereby preventing any possible accident. The main component of this work is the ultrasonic sensor, which is used to measure the distance to an object using sound waves. By recording the elapsed time between the wave being generated and the wave bouncing back, it is possible to calculate the distance between the sensor and the object. While camera module used for object detection. This system is cheap, fast and easy to use and it is an innovation for the blind and visually impaired people to help them overcome the various problems in their daily life.

INTRODUCTION

In light of the exponential growth in population and industrialization in the urban areas, the physically disabled have to rely more on the able individuals for their own daily activities, thereby becoming more of a liability than just another individual. This increase in dependence on a certain group of people and continuous tending to needs by another could be extremely difficult to bear for those individuals being relied on.

This is what the obstacle detecting eyeglasses have come to counter. They will enable the visually impaired to move independently and actually find their way on certain little things than having to burden those without disability for these minor needs they might want to fulfill.

OVERVIEW

If we talk about the project, then these are three important aspects of the project on which our whole project will work.

- Obstacle Detection
- Obstacle Avoidance
- Path Guidance

OBSTACLE DETECTION

Obstacle detection is the process of using sensors, data structures, and algorithms to detect objects or terrain types that impede motion.

Obstacle detection is a system problem that encompasses sensors that perceive the world, world models that represent the sensor data in a convenient form, mathematical models of the interaction between objects and person, and algorithms that process all of this to infer obstacle.

In this project, we will use several ultrasonic sensors to create a smart glasses with obstacle detection feature. The sensors will help us estimate the distance of the object from the nearby obstacles.

OBSTACLE AVOIDANCE

- The process by which a mobile robot autonomously modifies its own trajectory during navigation in order to avoid collisions.
- The obstacle avoidance system demonstrates a promising approach towards using technology to enable more independence for the visually impaired

PATH GUIDANCE

- A smart device can be smartly programmed and provides the best path guidance by providing necessary help to a blind person. This is a very safe and robust guidance system which helps many blind travelers with no worry about any obstacles on their moving path. So that it is easy for blind persons to travel and move independently to any unfamiliar environments. Ultrasonic sensor plays an important role that it measures the distance from objects. This assistance device may help independent and more self-sufficient for impaired and blind people

COMPONENTS USED :

- Arduino Uno
- Arduino BLE
- Servo Motor
- Ultrasonic Sensor
- Breadboard
- Connecting Wires
- Buzzer
- Glasses
- Arduino Power Supply
- Batteries 3.76volts (2 battery)
- ESP Programmer
- ESP Power supply
- ESP 32 Camp

TECHNOLOGY USED IN THE PROJECT

- Ultrasonic Distance Sensor → HC-SR04
Range → 2cm to 400cm
Ranging Accuracy → up to 3mm
- 4 PINS → VCC- Power
Trig - trigger(send signal)
Echo - Receiver
GND - Ground
- Servo Motor → Tower Pro SG 90 Servo 9gms mini/ micro
servo motor(gear-based motor)
Motion → 0 to 180 degrees
3 pins → Ground , Power , Position
- Connecting wires/ Jumping Cables → Type → Male to female
Male to male
Female to female

BENEFITS

- Allow blind people and those with limited sight to 'feel the space' through sounds
- Contains a sensor to warn the users if there is something in front of them or behind them.
- Increase the education level for blind people.
- These glasses use an algorithm to convert spatial and visual information into audio (buzzer sound)
- The glasses can detect material, recognize objects and vocalize the wearer's position, creating a sense of security.

FUTURE RECOMMENDATION

- While we were working on the implementation, we thought of many ideas and improvements for the “Smart Glasses”. However, we wished we had more time and knowledge to do that. “Smart Glasses” can be improved in the future for blind people and people who have vision difficulties by adding new techniques.
- For instance, direction and warning messages to prevent expected accidents, messages to tell the user about the battery level, video detection to provide a full healthy life for people with vision difficulties, develop mobile application to control “Smart Glasses”, use 270 camera to have more wider view angle., provide the glasses with GPS notification and develop the glasses’ design to have little, small and light components so the user can wear it easily.

CONCLUSION

Technology plays a very important role in our life. We use it almost everywhere and every time. The distinct and quick development that we discover each day is a proof for us that there is no point to give up and struggle with the obstacles in life. Technology offers us a lot of significant solutions to our problems and disapplies. Our role is to use it properly to reach the success level that benefits individual, society and whole country as well.

TEAM DISTRIBUTION

- SOFTWARE INTERFACE
MACHINE LEARNING :-

AMOGH SAXENA
SHAILY KAW

- ARDUINO :-

RITVIK CHAUDHARY

- HARDWARE INTERFACE :-

KUMUD TIWARI
AYUSH ADARSH

- DESIGN :-

VEDANT AGRAWAL
RAHUL PATEL

The background features a light gray base with large, soft-edged organic shapes in muted red and olive green. A thin white line outlines a shape on the right. In the top left, there is a faint sketch of a leafy branch.

THANK YOU

