A
MINI PROJECT REPORT
ON
"**Smart Glasses for Blind Person**"

Submitted to
PUNYASHLOK AHILYADEVI HOLKAR, SOLAPUR UNIVERSITY, SOLAPUR

For the Degree of Bachelor of Technology In
Artificial Intelligence and Machine Learning (Honors)

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Accredited by NAAC "A+" Grade

MINI PROJECT APPROVAL CERTIFICATE

This is to certify that the Mini project work entitled

"**Smart Glasses for Blind Person**"

Submitted by

Miss.Rohini Rajendra Mokashi
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Miss.Anuja Nandkumar Patil

Is hereby approved in partial fulfillment of the Bachelor of Technology in
Artificial Intelligence and Machine Learning (Honors).

Examiners:

Internal Examiner:	External Examiner:
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DECLARATION

I hereby declare that the research work embodied in present thesis entitled "**Smart Glasses for Blind Person**" is the outcome of my own efforts to the best of my knowledge and belief which is expected for the guidance received from my research guide. This work does not contain any material which is accepted by this university or any other university for the award of any other degree, except the earlier works that have been duly acknowledged.

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CERTIFICATE

This is to certify that the Mini project, entitled **"Smart Glasses for Blind Person"** is being submitted by **Miss.Rohini R. Mokashi, Miss.Sakshi V. Narayanpethkar, Miss.Anuja N. Patil** to the Solapur University, Solapur in partial fulfillment for the award of the degree of Bachelor of Technology in Artificial Intelligence and Machine Learning (Honors), is a record of bonafide research work carried out by them under my supervision and guidance.

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ABSTRACT

Blind mobility is one of the major challenges encountered by visually impaired persons in their daily lives. Their life and activities are greatly restricted by loss of eyesight. They normally travel using blind navigation system or by their accumulated memories in their long term exploration. The main objective of the present work is to develop a low cost, reliable, portable, user friendly, low power and robust solution for smooth navigation. This project (Smart Glasses for Blind People), as meant are the glasses are for visually impaired people. It has an in-built sensor in it which spreads ultrasonic waves in the direction the person is going by scanning at most 50-60 cm of 30° range. As soon as the obstacle is detected, the sensor detects it and sends it to the device which generates an automated voice in the earphone connected to the person's ear.

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CHAPTER 1
INTRODUCTION

INTRODUCTION

On an approximation 285 million people are visually impaired across the globe, among which 39 million are blind and 246 have low vision according to WHO statistics of 2011. About 90% of the world's visually impaired live in low-income settings whereas 82% of people living with blindness are aged 50 and above. India is now home to the world's largest number of 102 blinds. Out of the 37 million blind people worldwide, over 15 million are from India. The worst thing is that 75% of these are cases of avoidable blindness. India has an acute shortage of optometrists and donated eyes for the treatment of corneal blindness. While India needs 40,000 optometrists, it has only 8,000. Blind people are usually dependent on assistance from others. The assistance can be from human beings, dogs or some special electronic devices. There are already many existing devices which help a blind person in walking. The most common is the simple walking stick or cane. The blind man uses it to detect the obstacles by sweeping the cane back and forth but unfortunately sometimes the blind man gets aware about the obstacle too late. With the recent advances in technology normal walking cane has been modified to a blind stick with an ultrasonic sensor attached to it. It has several limitations. Therefore, the solution that has been protrayed in this paper is cost effective, reliable, robust and portable device which would help a blind person to walk on the streets almost like any other pedestrian.

Aim and Scope of project

The main objective of our present work is to provide a reliable, cost effective, low power solution for a blind people which would help them to move almost like any other normal pedestrian. The cost of this system makes it affordable for the majority of the society which in turn an effective device for them to spend on, just for once and assures wonderful travel guidance for them.

CHAPTER 2
LITERATURE REVIEW

LITERATURE REVIEW

In a rapidly flourishing country like our innumerable number of attempts has been made for the welfare of especially able people of our society. One of such attempts is the project "Project Prakash", an empathetic attempt towards the blind children to help them gain knowledge of a set of obstacles around them by using their brains. Shethtal worked on how a blind people can be able to detect any type of pits, potholes and several ups and downs by using a smart white cane where they have used ultrasonic sensors. In this device a multilingual system for audio feedback cannot be used because it can record only for 680 seconds. The idea that can be seen in has an ultrasonic sensor, a water sensor and a pit sensor. It also consists of a GPS system but here the user needs to give the present location as the input itself. The method of doing so has not been mentioned herein. In it can be observed that it consists of a video camera on the frame itself as well as a computer processing unit precise enough to get fit in the pocket and the software that provides images of objects close by to transparent displays on the eyepieces. The major limitation of this device is that it is not at all suitable for completely blind people. It is recommended only for people with low vision or night blindness. There is another new attempt of assisting the blind people which is named as H.A.L.O or Haptic Assisted Location of Obstacles. It consists of rangefinders that would take input from the ultrasonic sensors and output feedback to pulse vibration motors which are placed on the blind man's head. When the person gets closer to the object, the intensity and frequency of the vibration are increased. The main limitation is the use of vibration motor. The vibrations as an output feedback are far way irritating for any blind person.

CHAPTER 3
HARDWARE and CIRCUIT

HARDWARE REQUIREMENT

1.Ultrasonic Sensor :

Ultrasonic Sensor is a transducer which uses the physical characteristics and various other effects of ultrasound of a specific frequency which may transmit or receive the ultrasonic signal of a particular strength. These are available in electromagnetic or piezoelectric versions. The piezoelectric type is generally preferred due to its lower cost and simplicity to use comparatively than other types [7]. The system mainly lies on the principle of Ultrasonic Range Finding sensor or simply an ultrasonic sensor. It works on 40 KHz ultrasonic sound wave which when triggered by its transmitter module, its receiver module receives back the echo of the triggered signal, having a sensing angle of 30°. The block diagram of an ultrasonic sensor is shown below in Fig.1. The propagation velocity of the ultrasonic wave is approximately 340m/s at 15°C of air or atmospheric temperature. The ultrasound velocity depends by the propagation medium and its temperature; hence the velocity in air is calculated using the equation 1, where t is the temperature in °C.

2.TP4056 charging Module and Battery(3.7V):

The TP4056 charging module is a popular choice for charging lithium-ion or lithium-polymer batteries, including those with a nominal voltage of 3.7 volts. The TP4056 charges the connected battery in a constant-current/constant-voltage (CC/CV) charging mode.Initially, it delivers a constant charging current to the battery until it reaches a predefined voltage threshold (typically around 4.2 volts for lithium-ion batteries).Once the battery voltage reaches the threshold, the charger switches to constant voltage mode, where it maintains the voltage at the threshold level while reducing the charging current until the charging current drops below a certain level.

3.Buzzer:

A buzzer, whether piezoelectric or magnetic, operates by converting electrical energy into mechanical vibrations, which, in turn, produce sound waves. When an alternating current (AC) or direct current (DC) is applied to the buzzer, it causes the buzzer's internal components to vibrate. These vibrations generate sound waves in the surrounding medium, producing an audible tone or alert. The frequency and volume of the sound produced depend on the design, specifications, and input voltage of the buzzer. Buzzers are commonly used in alarm systems, electronic devices, and DIY projects to provide audible alerts or notifications.

4.Timer IC 555 :

The timer IC 555 operates in two main modes:

1. Monostable Mode (One-Shot): Generates a single output pulse when triggered.
2. Astable Mode (Free-Running Oscillator): Generates a continuous square wave output.

In monostable mode:

When triggered, the IC produces a single output pulse whose duration is determined by external resistors and capacitors.

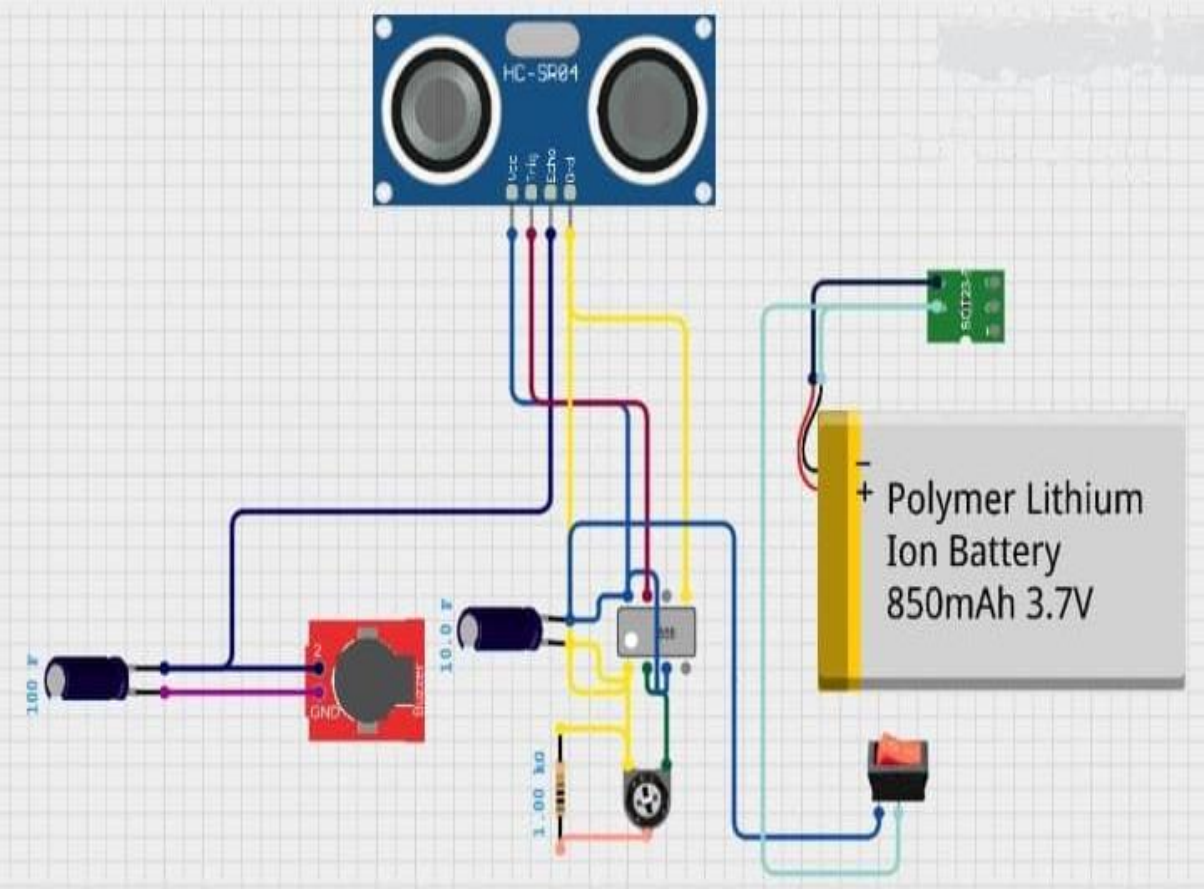
The capacitor charges and discharges through external components, controlling the pulse width.

In astable mode:

The IC continuously oscillates between high and low states, producing a square wave output.

External resistors and capacitors determine the frequency and duty cycle of the output waveform.

CIRCUIT DIAGRAM:



CHAPTER 4
ADVANTAGES and DISADVANTAGES

ADVANTAGES

1. **Enhanced Safety:** By detecting obstacles in the user's path, the smart glasses provide real-time alerts, reducing the risk of collisions and accidents.
2. **Improved Mobility:** Visually impaired individuals can navigate their surroundings with greater confidence and independence, leading to improved mobility and quality of life.
3. **User-Friendly Design:** The integration of the components into smart glasses ensures a discreet and convenient solution for users, without the need for carrying separate devices.
4. **Efficient Power Management:** The TCP charging module ensures efficient charging of the glasses' battery, providing uninterrupted operation and extended usage time for the user.
5. **Customizable Feedback:** The IC 555 timer allows for customizable feedback signals based on the detected obstacles, catering to the specific needs and preferences of individual users.
6. **Cost-Effective Solution:** By utilizing readily available components such as the ultrasonic sensor, TCP charging module, and IC 555 timer, the project offers a cost-effective solution compared to specialized assistive devices.
7. **Scalability and Accessibility:** The project can be scaled up for mass production and distribution, making the smart glasses accessible to a wider population of visually impaired individuals.

DISADVANTAGES

1. **Technical Limitations:** The performance of the smart glasses may be affected by technical limitations such as the detection range and accuracy of the ultrasonic sensor, as well as the reliability of the IC 555 timer and TCP charging module.
2. **Dependency on Technology:** Visually impaired individuals may become overly reliant on the smart glasses, potentially reducing their ability to develop alternative navigation skills or strategies.
3. **Sensory Overload:** Constant feedback from the smart glasses, such as audio alerts or vibrations, could lead to sensory overload or fatigue for some users, particularly in busy or noisy environments.
4. **Maintenance and Support:** Smart glasses require regular maintenance and technical support to ensure proper functioning, which may pose challenges for users who lack access to technical expertise or assistance.
5. **Stigma:** Despite the potential benefits, some visually impaired individuals may feel stigmatized or self-conscious about using assistive devices like smart glasses, particularly if they attract unwanted attention or curiosity from others.
6. **Risk of Malfunction:** Like any electronic device, smart glasses are susceptible to malfunctions or technical issues, which could disrupt their functionality and reliability, potentially compromising the safety and well-being of the user.

CHAPTER 5
RESULTS & CONCLUSIONS

RESULTS

In this protocol when we find object but distance of object is greater than 1 meter then it not sense, if distance is less than 50cm then it sense and vibrate. When the distance between object and user are closer then sound effect of buzzer is highly intensive.

Here this smart glass can detect the object by sensor and make alert the user.

Sr. No.	Distance	Output
1.	50 cm	Buzzer ON
2.	1 meter	Buzzer OFF

CONCLUSIONS

In conclusion, the project to develop smart glasses for visually impaired individuals using components such as an ultrasonic sensor, TCP charging module, and IC 555 timer offers a promising solution to enhance safety, mobility, and independence. Despite potential disadvantages, the overall benefits of the project outweigh the drawbacks, provided that careful consideration is given to design, implementation, and user support. By leveraging technology and innovation, the smart glasses have the potential to positively impact the lives of visually impaired individuals by providing real-time obstacle detection, efficient power management, and customizable feedback. Moving forward, continued refinement, accessibility, and collaboration with stakeholders will be essential to maximize the effectiveness and accessibility of the smart glasses for a wider range of users. Ultimately, the project represents a significant step forward in leveraging technology to improve the quality of life for individuals with visual impairments.

CHAPTER 6
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