20EC5203 ELECTRONIC DESIGN PROJECT- I
MODULE 1 - THE THIRD EYE
MODULE 2 - THE SMART TRASH

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BATCH-36

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MODULE 1 - THE THIRD EYE

ABSTRACT

In industrial settings, machinery poses signif cant risks of injuries to workers due to unintentional contact, malfunction, or human error. The Third Eye project aims to address these risks by developing an advanced electronic eye system for enhanced safety. By utilizing ultrasonic sensors and a robust control mechanism, the project seeks to prevent accidents, reduce operational disruptions, and ensure compliance with industrial safety standards. This innovation can lead to improved workplace safety, increased productivity, and a healthier working environment.

INTRODUCTION

- The Third Eye project aims to address the pressing need for improved safety in industrial environments, where machinery-related hazards pose significant risks to workers.
- This project focuses on developing an advanced safety system designed to prevent accidents caused by human error, equipment malfunctions, or unintentional contact with hazardous machinery.
- By creating a cost-effective and scalable solution, the project ensures accessibility for industries of all sizes, adhering to safety regulations and standards to protect workers effectively.
- Ultimately, the Third Eye project seeks to foster safer industrial environments, enhancing productivity and worker well-being through innovative sensor technology.

OBJECTIVE AND SCOPE

OBJECTIVE

1. **Enhance Worker Safety**: Develop or improve electronic eye systems to reduce the risk of accidents and injuries in industrial settings.
2. **Improve Detection Accuracy**: Increase the precision of detecting potential hazards in real-time to prevent accidents before they occur.

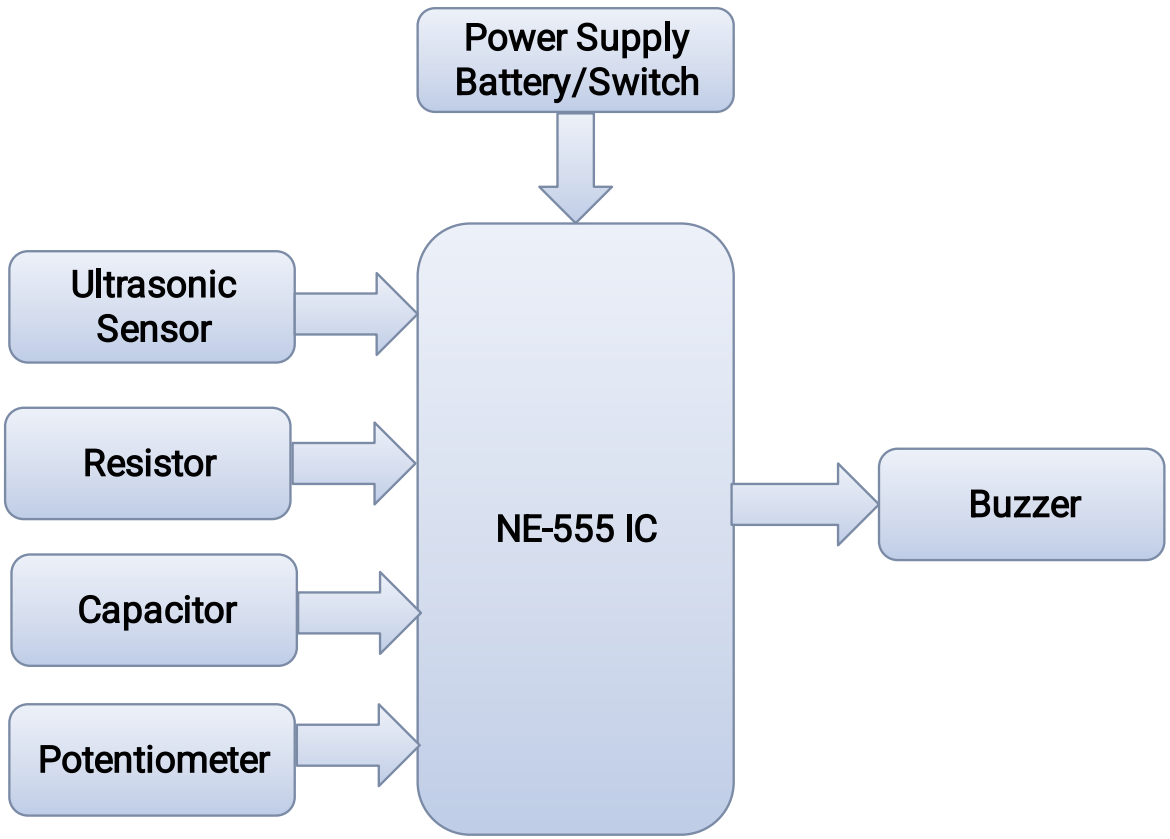
SCOPE

1. **Integration with Machinery**: Seamlessly integrate the safety system into existing industrial machinery without significant modifications. Develop an advanced electronic eye system that covers broader areas with minimal blind spots.
2. **Compliance with Safety Standards**: Ensure the system meets industrial safety standards and regulations, enhancing worker protection while maintaining operational efficiency.

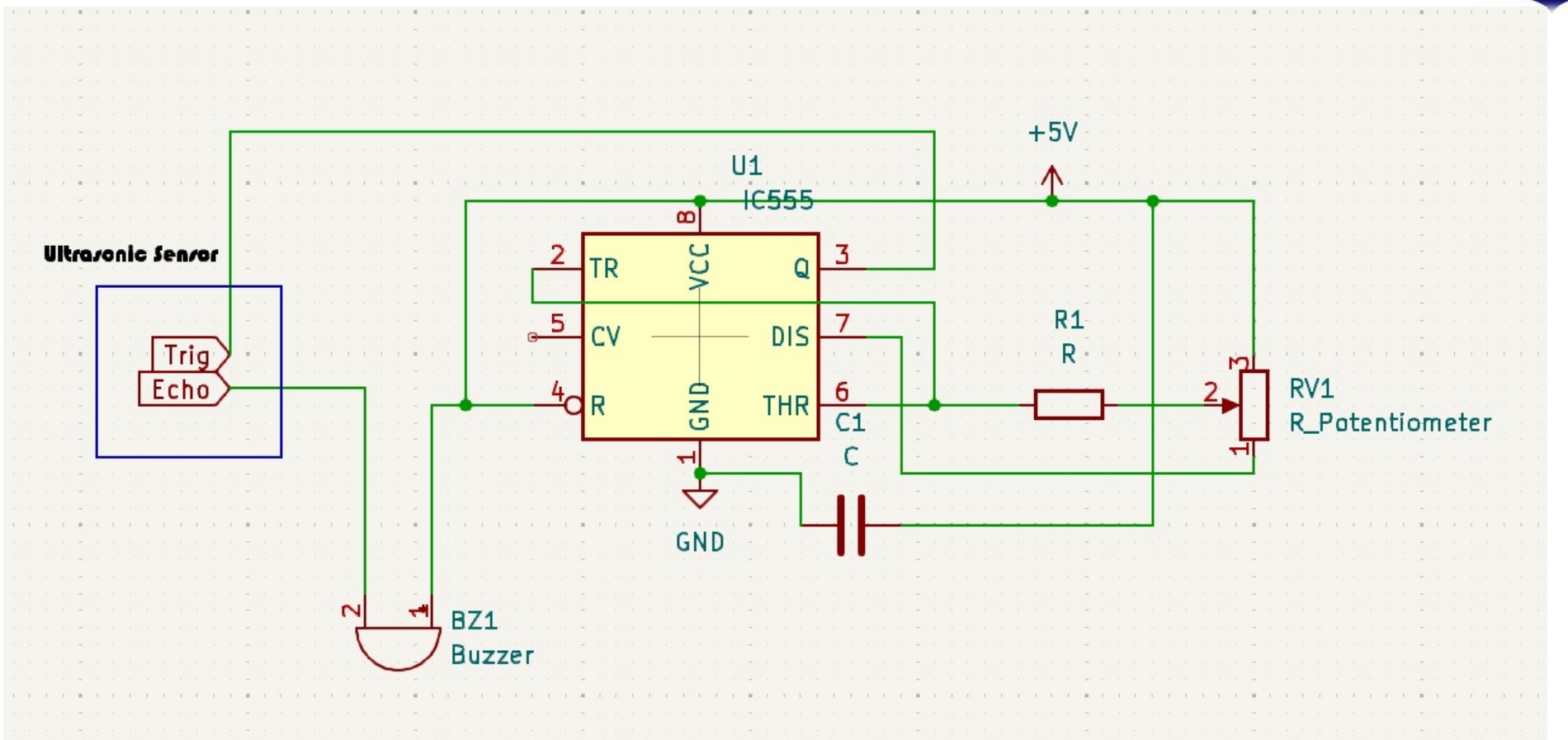
LITERATURE SURVEY

REF. NO	TITLE & AUTHOR	METHODOLOGY OR COMPONENTS USED	PROS	CONS
1	"Advanced Safety Systems in Industry" - J. Smith	Photoelectric sensors for motion detection	Real-time hazard detection, easy to install	Limited range, prone to false triggers in dusty environments
2	"Human-Machine Safety Integration" - A. Patel	Integration of electronic eyes with machine automation	Automated safety response, reduces human error	High installation cost, requires system compatibility
3	"Workplace Safety with Sensors" - B. K. Reddy	Multiple sensor layers including infrared and pressure sensors	Accurate hazard detection, covers wider areas	Complex setup, regular maintenance needed
4	"Smart Sensor Technologies for Industry" - M. Lee	AI-powered electronic eye with machine learning capabilities	Self-learning system, adapts to changing environments	Expensive, requires high computational power
7	"Industrial Safety Mechanisms" - T. Hernandez	Combination of electronic eye with safety barriers	Dual protection, improves overall safety	Slows down operations, physical barriers

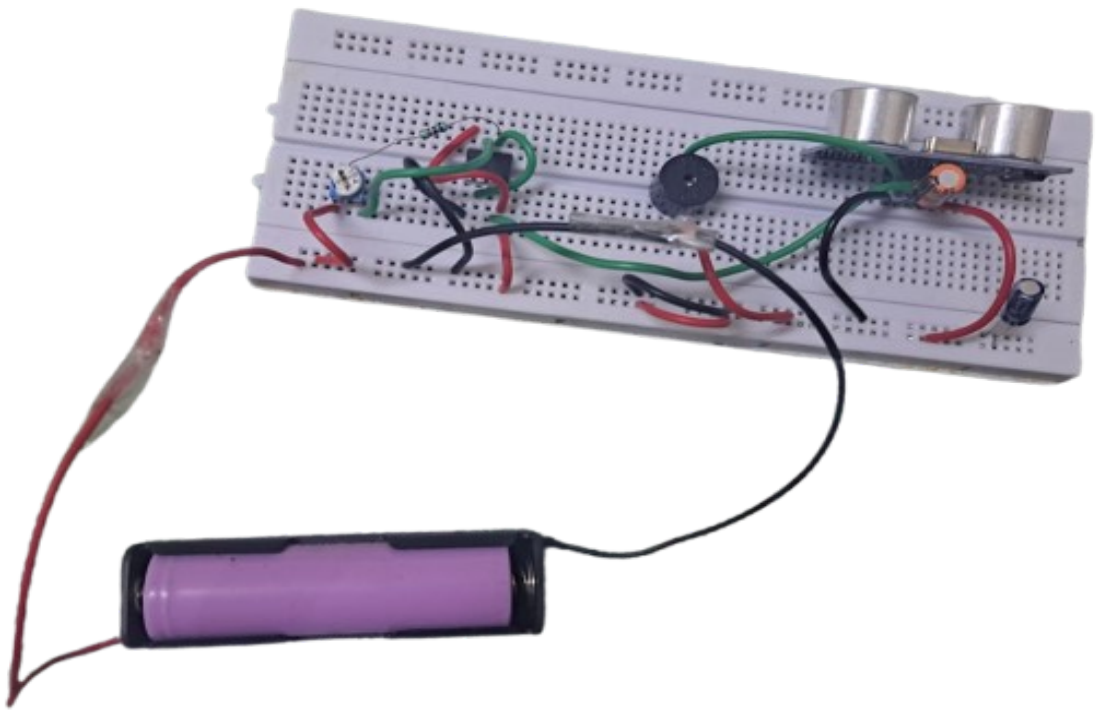
BLOCK DIAGRAM



CIRCUIT DIAGRAM



HARDWARE MODULE



Video Link: https://drive.google.com/file/d/1B1C2Py8T0H4QMlQv8qTJExNTibRLzvV4/view?usp=drivesdk

HARDWARE INVOLVED

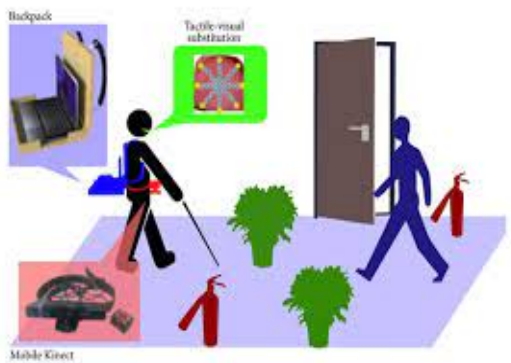
HARDWARE COMPONENTS

- Ultrasonic Sensor-1
- NE-555 Timer IC-1
- Potentiometer-1
- Buzzer-1
- Resistor-2 (1KΩ)
- Capacitors-1 (100µf)
- Battery-1
- Switch-1
- Connecting Wires-As Required

APPLICATIONS & ADVANTAGES

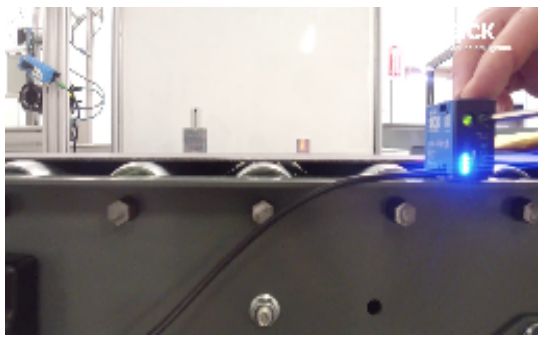
APPLICATIONS

- Industrial Safety
- Manufacturing Plants
- Warehouses & Storage Facilities
- Automated Production Lines
- Construction Sites



ADVANTAGES

- Improved Worker Safety
- Cost-Effective
- Real-Time Monitoring
- Adjustable Sensitivity
- Easy Integration
- Low Maintenance
- Enhanced Productivity
- Scalable Solution



MODULE 2 - THE SMART TRASH

ABSTRACT

The **Smart Trash** project introduces an automated, touchless trash bin system that enhances hygiene by using infrared sensors to detect human presence and automatically open the lid. It reduces physical contact, minimizes germ spread, and optimizes waste disposal. The system includes real-time feedback to alert users when the bin is full or needs maintenance, offering a sustainable, energy-efficient solution for waste management in high-traffic areas like parks, malls, and office buildings.

INTRODUCTION

- The **Smart Trash** project addresses the growing need for efficient and hygienic waste disposal systems, particularly in high-traffic public spaces. Traditional trash bins often require manual operation, which can lead to hygiene concerns, user discomfort, and improper waste disposal.
- This project proposes an automated solution using infrared sensors to detect human presence and open the bin lid without physical contact, thus reducing the spread of germs and promoting cleaner environments. By automating the process, the system ensures that waste is disposed of properly, while real-time feedback alerts users when the bin is full or needs maintenance.
- Designed for ease of use, energy efficiency, and minimal maintenance, the Smart Trash system aims to improve waste management in public parks, malls, offices, and other high-traffic areas, contributing to healthier, cleaner spaces and reducing human error in waste disposal.

OBJECTIVE AND SCOPE

OBJECTIVE

1. **Enhance Hygiene**: Develop a smart trash bin that minimizes physical contact, reducing the spread of germs and promoting cleaner public spaces.
2. **Improve Waste Disposal**: Encourage proper waste disposal by making it easier and more convenient for users to access the bin.

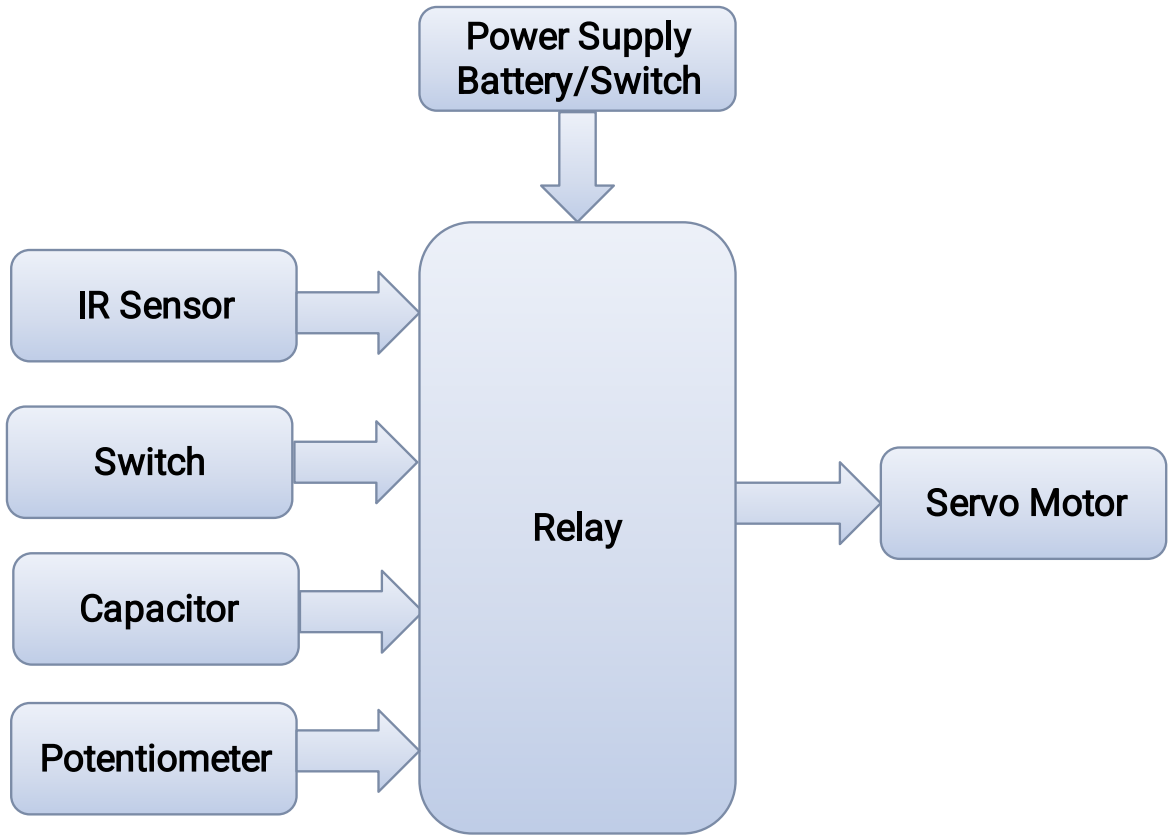
SCOPE

1. **Design and Development**: Create a prototype of the smart trash bin, incorporating infrared sensors, touchless operation mechanisms, and an automatic closing feature.
2. **Deployment**: Plan for the installation of smart trash bins in strategic locations, such as parks, malls, and public buildings. Develop a user feedback mechanism to gather insights for future improvements and enhancements.

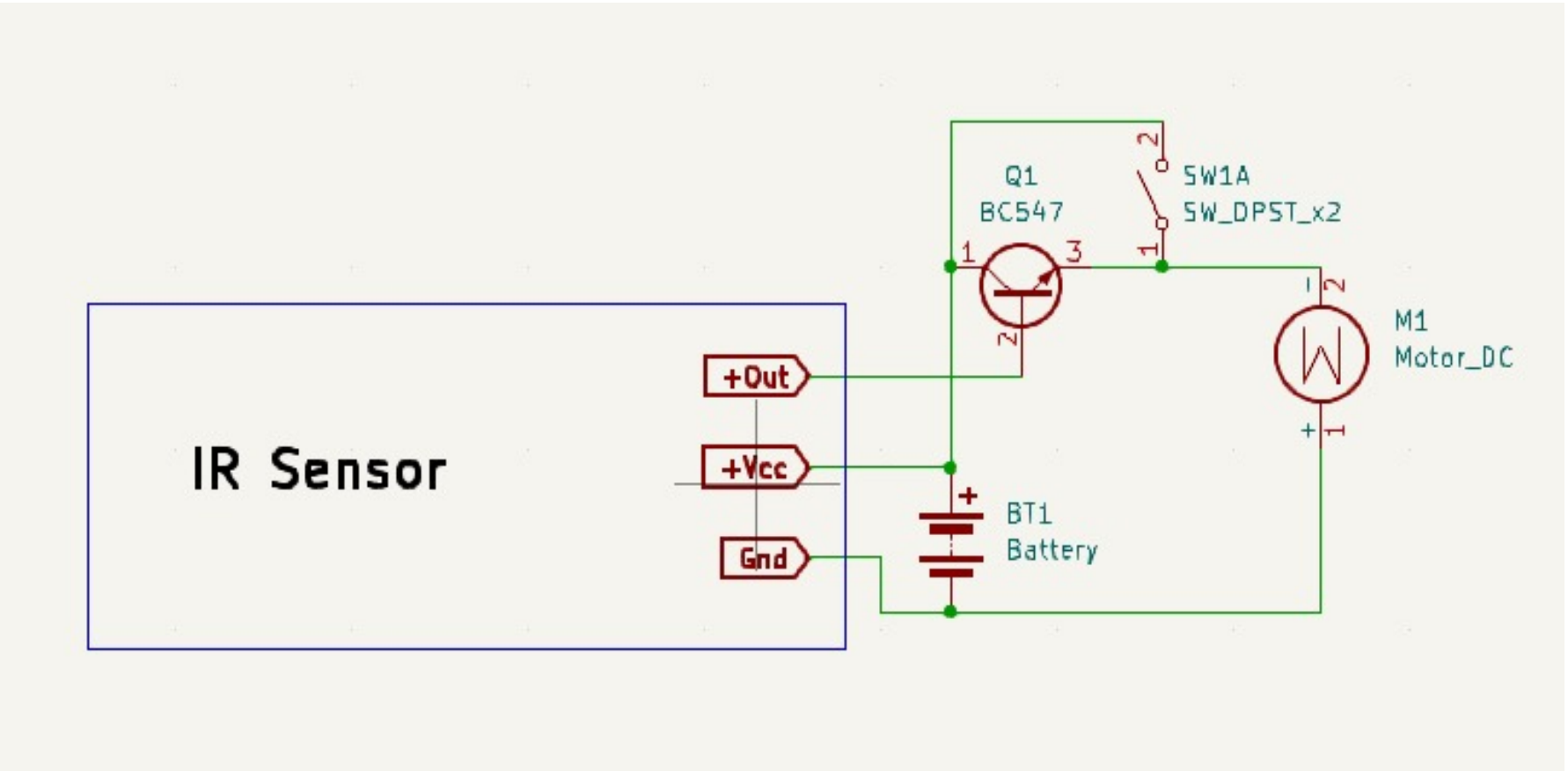
LITERATURE SURVEY

REF. NO	TITLE & AUTHOR	METHODOLOGY OR COMPONENTS USED	PROS	CONS
1	"IoT-Based Smart Waste Management System" - J. Doe	Utilizes IoT sensors for fill level and motion detection	Improves waste collection efficiency, reduces costs	High initial setup costs, requires technical expertise
2	"Touchless Technology in Public Spaces" - A. Smith	Incorporates infrared sensors for hands-free operation	Enhances hygiene, minimizes physical contact	Possible interference from environmental factors
3	"Smart Trash Bins: A Case Study" - B. Reddy	Combines ultrasonic sensors with a solar power system	Eco-friendly, reduces energy costs	Dependence on sunlight for power, may not work in shaded areas
4	"Designing User-Friendly Waste Solutions" - M. Lee	User-centered design approach with feedback mechanisms	Increases user engagement and satisfaction	May require continuous updates based on user feedback
5	"Environmental Impact of Smart Waste Solutions" - T. Hernandez	Analyzes data from smart bins on recycling and waste levels	Reduces littering, promotes recycling	Implementation challenges in older urban areas

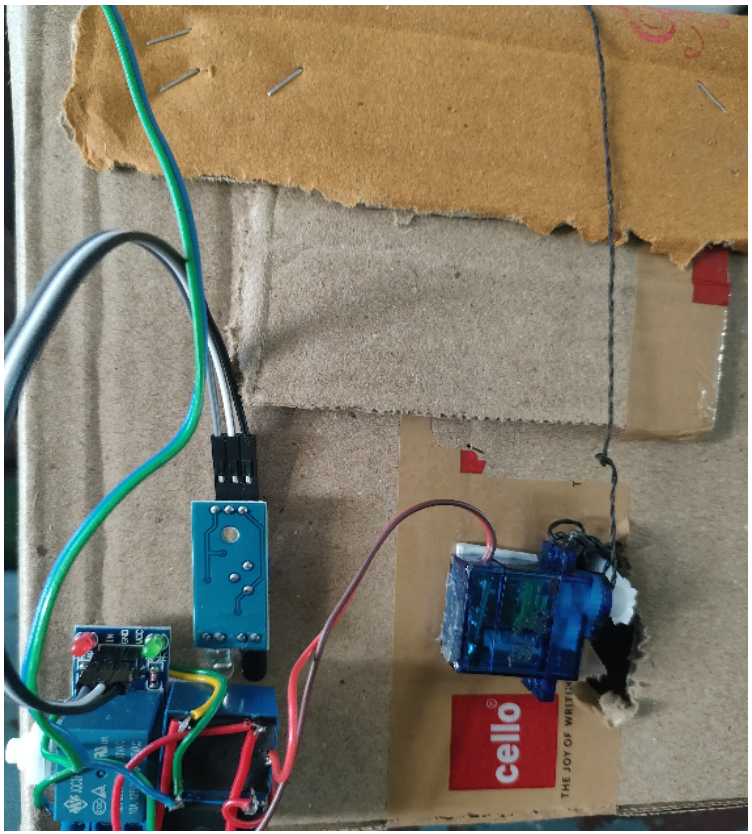
BLOCK DIAGRAM

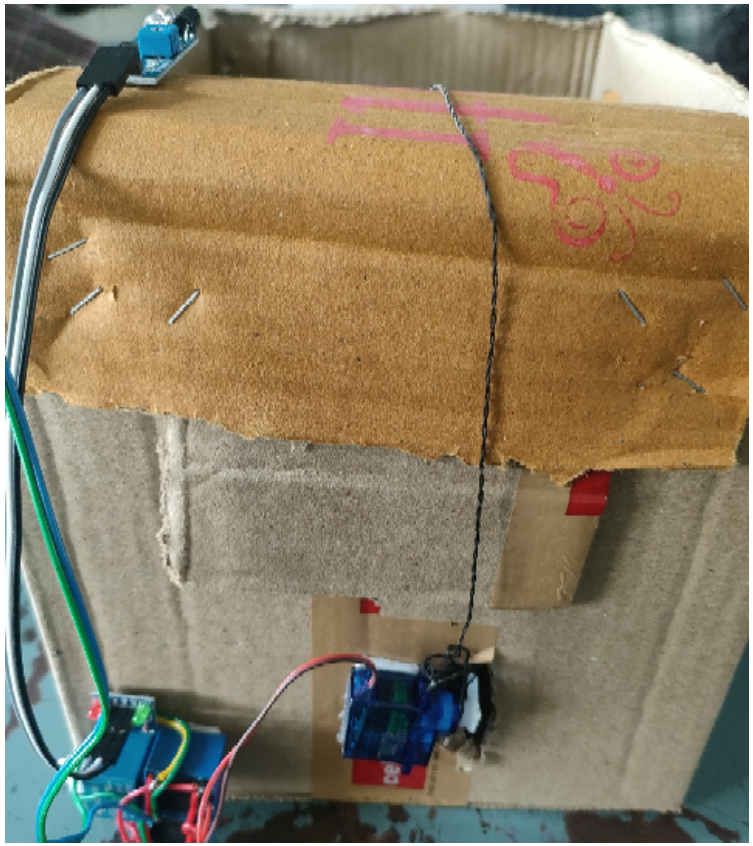


CIRCUIT DIAGRAM



HARDWARE MODULE





Video Link: https://drive.google.com/file/d/1B6Ft1GE05H_Fj1Z7PrP5TadOFRmb1bIA/view?usp=drivesdk

HARDWARE INVOLVED

HARDWARE COMPONENTS

- Infrared (IR) Proximity Sensor-1
- Servo Motor-1
- Battery-1
- Relay-1
- Switch-1
- Potentiometer-1
- Jumper Cables-As Required

APPLICATIONS & ADVANTAGES

APPLICATIONS

- Public Spaces
- Office Buildings
- Healthcare Facilities
- Educational Institutions
- Event Venues

ADVANTAGES

- Enhanced Hygiene
- Energy Efficiency
- Convenience
- Real-Time Monitoring
- Cost-Effective
- User-Friendly Design
- Reduced Labor Costs
- Scalable Solution

CONCLUSION

The **Third Eye** project provides an automated industrial safety system that detects hazards in real-time and alerts workers, signif cantly reducing the risk of accidents and improving workplace safety.

The **Smart Trash** system offers a touchless, energy-ef cient waste disposal solution that improves hygiene, optimizes waste management, and reduces manual labor through automated monitoring and real-time feedback.

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THANK YOU