



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 Issue: IV Month of publication: April 2025

DOI: <https://doi.org/10.22214/ijraset.2025.68366>

www.ijraset.com

Call:  08813907089

E-mail ID: ijraset@gmail.com

Design of SensoBot

K. Kalyani¹, SP. Faheema Firdos², R.Hema Chandra³, S.Izhar Ul Hasan⁴, D.Sudesh⁵, S.Khadar Vali⁶

Abstract:

- *SensoBot is a smart robot designed for motion and object detection.*
- *Utilizes IR sensors and motion sensors.*
- *Controlled using an Arduino microcontroller.*
- *Displays output and status on a digital display.*
- *Suitable for automation, security, and educational purposes.*

I. INTRODUCTION

- 1) SensoBot enhances automation and intelligent systems.
- 2) Sensors detect environmental changes and objects.
- 3) Arduino provides an easy platform for robotics control.
- 4) SensoBot combines sensors and microcontroller for real-time response.
- 5) Emphasis on low-cost and flexible design.

II. PROPOSED SYSTEM

The SensoBot is designed as a compact and efficient robot that uses infrared (IR) sensors, motion sensors, and an Arduino microcontroller to detect objects and movement in its surroundings. The system architecture consists of the following key components:

1) *IR Sensor (Infrared Sensor):*

- **Function:** Detects obstacles or nearby objects by emitting and receiving infrared light.
- **Working:** When an object comes in front of the IR sensor, the emitted IR light reflects back and is detected by the receiver.
- **Use in SensoBot:** Helps in identifying objects in close proximity, useful for obstacle avoidance or object detection.

2) *PIR Motion Sensor (Passive Infrared Sensor):*

- **Function:** Detects motion by sensing infrared radiation (heat) from humans or animals.
- **Working:** When a warm body (like a human) moves in its range, the PIR sensor detects the change and sends a digital signal.
- **Use in SensoBot:** Enables the bot to detect human or animal presence in its surroundings, making it suitable for surveillance or automation.

3) *Arduino Microcontroller (e.g., Arduino UNO):*

- **Function:** Acts as the central processing unit.
- **Working:** Takes input from sensors, processes the data using programmed logic, and controls output devices like the display.
- **Use in SensoBot:** Receives real-time data from IR and PIR sensors, processes it, and executes appropriate actions such as displaying messages or triggering alarms.

4) *Display Module (e.g., LCD or OLED):*

- **Function:** Provides visual feedback to the user.
- **Working:** Shows messages such as "Object Detected," "Motion Detected," or "No Movement."
- **Use in SensoBot:** Enhances user interaction by displaying the bot's current status and sensor output.

5) *Power Supply:*

- **Function:** Powers the entire circuit.
- **Types:** Rechargeable battery pack, 9V battery, or USB power from a computer or adapter.
- **Use in SensoBot:** Ensures portability and uninterrupted operation.

6) *Optional Add-Ons:*

- Buzzer/Alarm: Can be activated during motion detection.
- Motor Driver & Wheels: Can be added to make the bot mobile.
- LED Indicators: For visual signals (blinking on detection).

7) *Integration Flow:*

- IR and PIR sensors monitor the surroundings.
- Upon detection, they send signals to Arduino.
- Arduino interprets the signals and sends output to the display.
- Optional actions like buzzer sound or movement can be triggered.
- The system resets and continues scanning.

8) *Working Mechanism*

- IR sensor detects objects using reflected infrared rays.
- PIR sensor senses motion using heat (human/animal presence).
- Arduino collects and processes sensor data. If motion/object detected:
- Arduino activates output display.
- Optional: sound alert or movement action.





III. FEATURES&ADVANTAGES

A. Features

- 1) Real-time object and motion detection.
- 2) Digital display for feedback.
- 3) Simple, modular, and compact design.
- 4) Arduino-based programming and control.

B. Advantages

- 1) Low-cost and energy-efficient.
- 2) Easy to build and modify.
- 3) Suitable for multiple environments.
- 4) Enhances automation and security

IV. APPLICATIONS

- 1) Home automation and security systems.
- 2) Obstacle detection for robots.
- 3) Smart industrial automation.
- 4) Surveillance and monitoring systems.
- 5) School and college project models.

V. CONCLUSION

- 1) SensoBot is an effective and affordable robot using basic sensors.
- 2) Ideal for learning, automation, and practical applications.
- 3) Can be enhanced with IoT, camera, or wireless features.
- 4) Promotes innovation in robotics and smart systems.



10.22214/IJRASET



45.98



IMPACT FACTOR:
7.129



IMPACT FACTOR:
7.429



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24*7 Support on Whatsapp)