Sindh Agriculture University, Tandojam

Information Technology Centre

Project Report on

SENSELT! ALARM SYSTEM

A Touch Based Alarming System

Submitted
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The Senselt Alarming System is a project designed to detect motion and alert users through both sound (buzzer) and visual (LED) signals. The system uses a motion sensor to detect any movement, which triggers a buzzer and an LED to activate. Components like a buzzer, wires, LED, transistor, resistors, and a noninsulated wire are utilized to build a simple and efficient alarm system.

Objective:

The primary objectives of this project are:

- To create a motion detection system that senses movement.
- To provide an alert using both a sound (buzzer) and light (LED).
- To use cost-effective and simple electronic components for a practical solution.

Components Used:

1. **Motion Sensor** – Detects motion in the surrounding environment.
2. **Buzzer** – Provides an audible alarm when motion is detected.
3. **LED** – Offers a visual indication that the system is active.
4. **Transistor** – Used for signal amplification and switching.
5. **Resistors** – Protect the components by controlling the flow of current.
6. **Battery** – Powers the system.
7. **Non-insulated Wire** – Used for touch connections and circuit continuity

Working Principle:

1. **Motion Detection:** The motion sensor continuously monitors the surrounding environment for any movement.
2. **Signal Processing:** When motion is detected, the sensor sends a signal to the transistor. The transistor amplifies the signal and triggers both the buzzer and the LED to turn on.
3. **Alarm Activation:** The buzzer produces an audible sound, while the LED lights up to visually indicate the system is active.
4. **Touch Connection:** The non-insulated wire is used for touch connections, which can trigger or deactivate the system when touched.

Working:

- When the system is powered on, the motion sensor constantly monitors for any movement.
- If movement is detected, the transistor processes the signal and activates the buzzer.
- The LED also turns on simultaneously, providing a visual alert.
- The system responds quickly to motion, even small movements can trigger the alarm.:

Applications:

- **Home Security**: This system can be used in homes for detecting unauthorized movement and alerting homeowners with sound and light.
- **Offices/Factories**: It can be employed in workplaces for detecting intrusions or monitoring activity in restricted areas.
- **Robotics**: Used for creating automated systems that can detect human presence or other objects in the environment.
- **Automation Systems**: This sensor-based alert system can be integrated into larger automated control systems.

Advantages:

1. **Simple Design:** The system is easy to understand and build.
2. **Low Cost:** The components used are affordable, making it a costeffective solution.
3. **Effective Security:** Provides basic security by detecting movement and alerting through sound and light.
4. **Low Power Consumption:** Battery-powered, making it energy-efficient.

Disadvantages:

1. **Limited Range:** The motion sensor has a limited detection range.
2. **False Alarms:** The sensor may trigger false alarms if it detects irrelevant movements (e.g., wind or pets).

Truth Table:

The truth table below summarizes the behavior of the system based on the motion detection and system state:

Motion Detected (PIR Sensor)	Transistor	Buzzer	LED
0 (No motion)	OFF	OFF	OFF
1 (Motion detected)	ON	ON	ON

Explanation:

- 0 (No motion): When there is no motion, the PIR sensor outputs 0. This turns the transistor off, keeping the buzzer and LED off as well.
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- 1 (Motion detected): When motion is detected, the PIR sensor outputs 1, activating the transistor. This turns on the buzzer and the LED.

Conclusion:

The Senselt Alarming System is a simple and cost-effective solution for detecting motion and providing alerts through both sound and light. This project helped in understanding the working of basic electronic components and sensor technology. In the future, the system can be improved with additional features such as remote monitoring, mobile alerts, or integrating with other security systems.