



Inspiring Excellence

CSE461

Section : 06

Group : 04

Semester : Spring 2025

Project User Manual

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Project Title: Home Security & Automation System

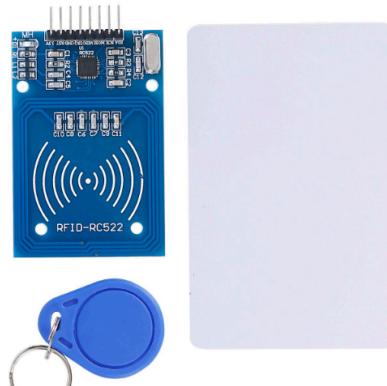
Introduction:

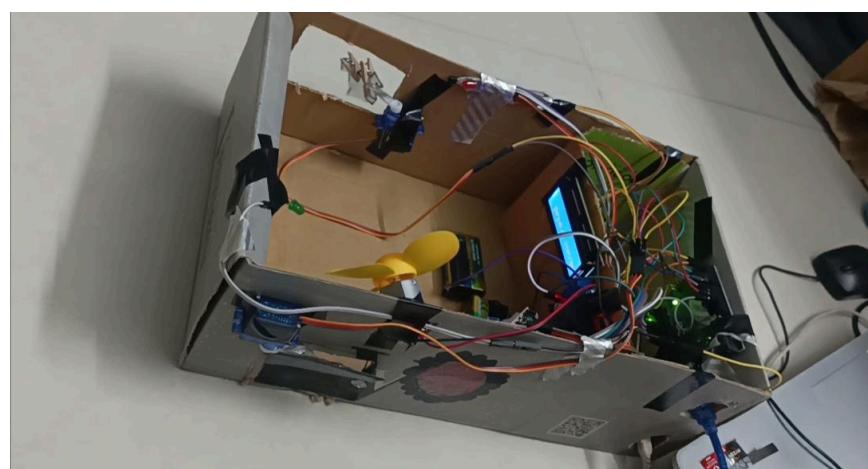
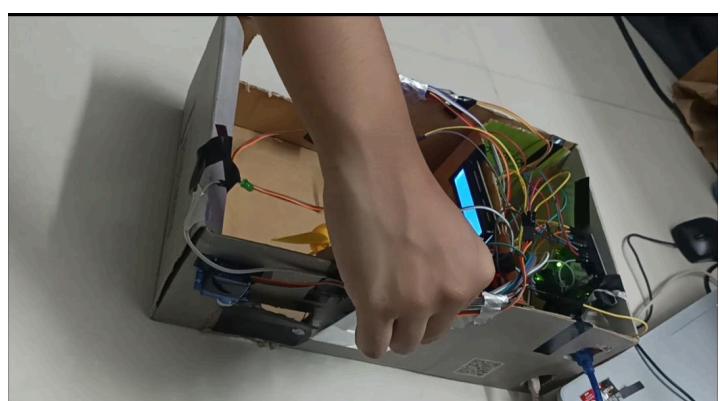
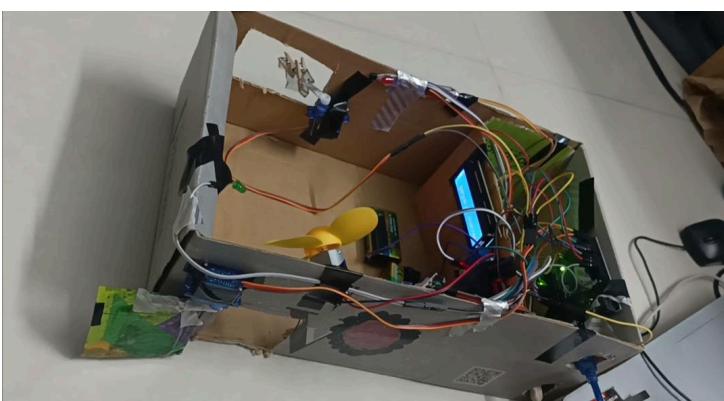
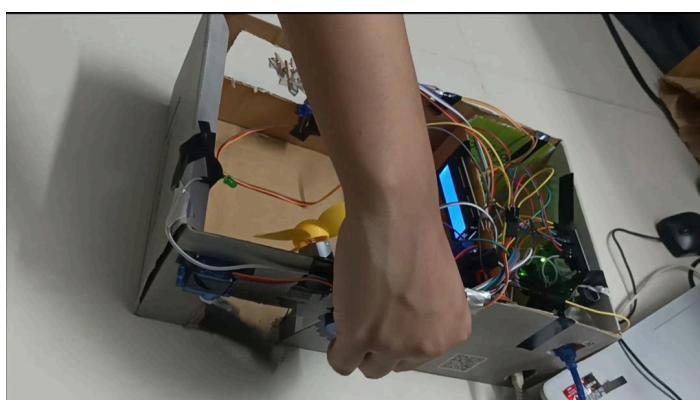
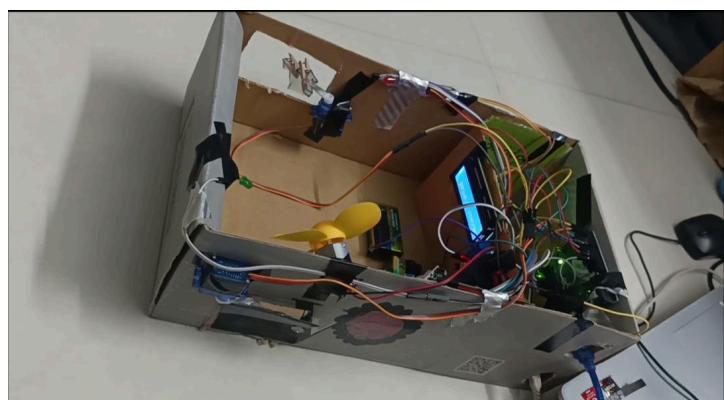
The primary goal of this project is to develop a smart home security and automation system that integrates multiple sensors and actuators to enhance security of a residence and automate appliances.

The system will be designed for residential security and automation, enabling smart access control using RFID authentication, intrusion detection, fire hazard prevention and temperature-based fan control.

Feature 1: RFID-Based Door Security System

- **Overview:** Secure authorized access into residence using RFID Authentication
- **Working Procedure:** The RFID sensor will first scan the authorized RFID tag/card. If it is authenticated, the servo motor will open the door. If an unauthorized card is scanned, the buzzer will be activated.

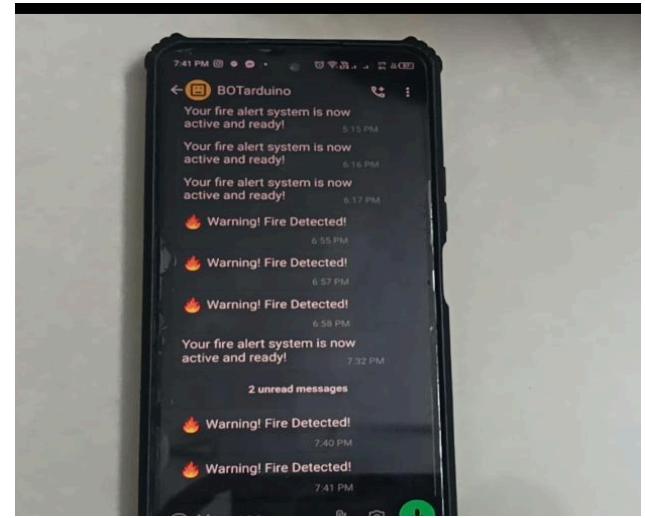
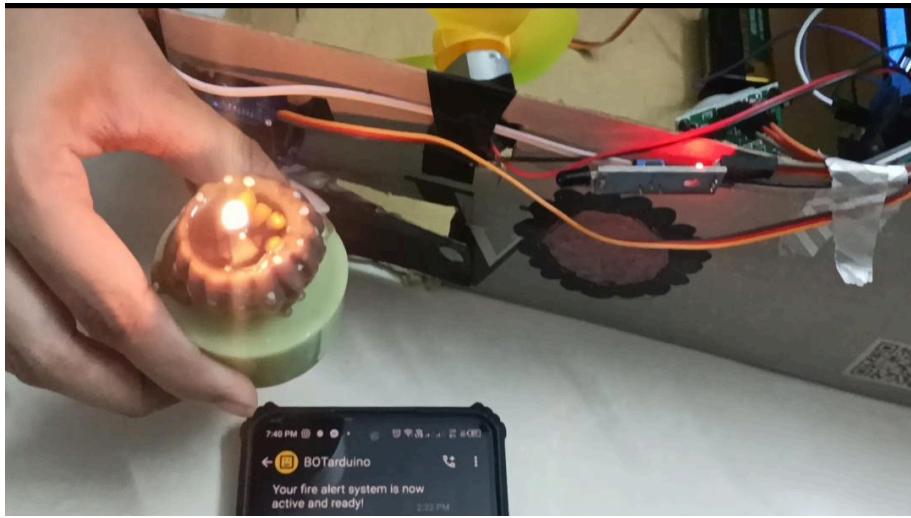
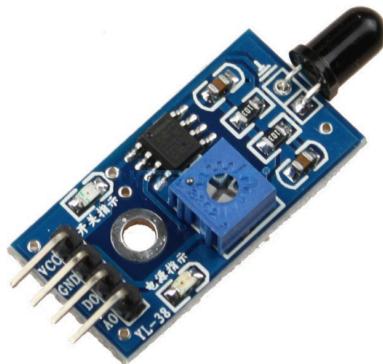




Here, an RFID sensor is being used to control and secure access into the residence. When an RFID tag or card is scanned, the system checks if it matches the authorized credentials stored in memory. If the tag is authorized, a servo motor is activated to unlock or open the door. However, if an unauthorized card is scanned, the system triggers a buzzer to alert occupants of a potential unauthorized access attempt.

Feature 2: Automated Fire Detection & Notification System

- **Overview:** The flame sensor detects the presence of fire and alerts users through a buzzer and a WhatsApp message using the ESP module.
- **Working Procedure:** When the system is switched on, it immediately sends a message via the ESP module to WhatsApp saying, "Your fire alert system is now active and ready!" After that, the flame sensor begins monitoring the surroundings for any signs of fire. If it detects a flame, the system activates a buzzer to alert the residence. At the same time, a message is sent to WhatsApp that says, "Warning!! Fire detected." This ensures that the user is notified both through sound and remotely via their phone, even if they are not near the system.

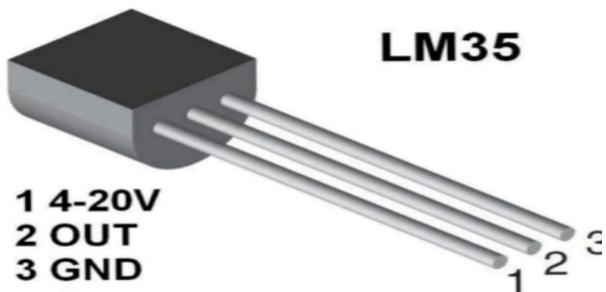


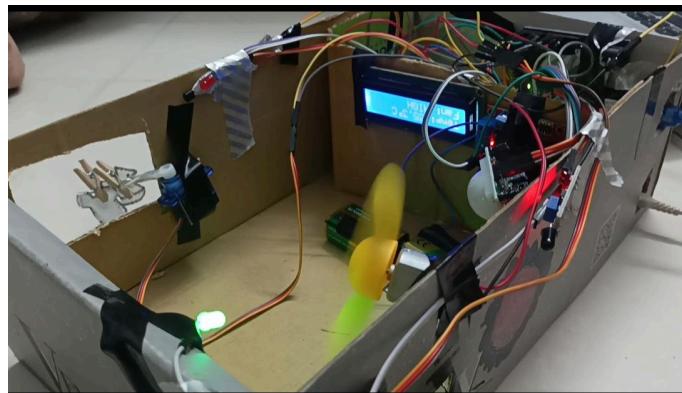
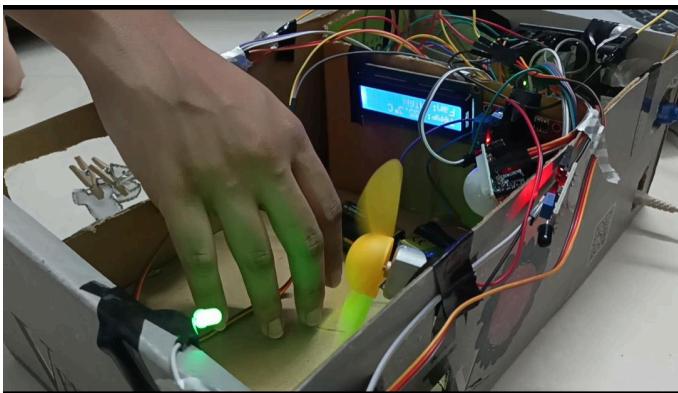
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Feature 3: Motion and Temperature-Based Fan Control

- **Overview:** Controls fan operation based on room occupancy and temperature.
- **Working Procedure:** The PIR sensor shall detect human presence in the room and if a person is present and the temperature sensor detects high temperature, the fan will be turned on. If no human presence is detected, the fan remains off regardless of temperature.



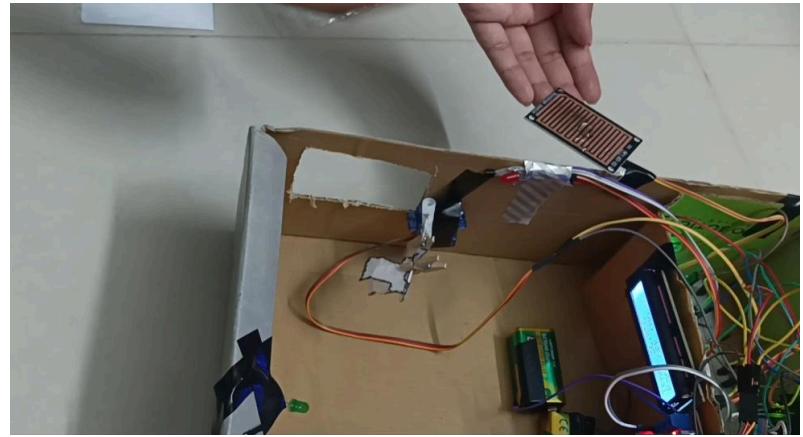
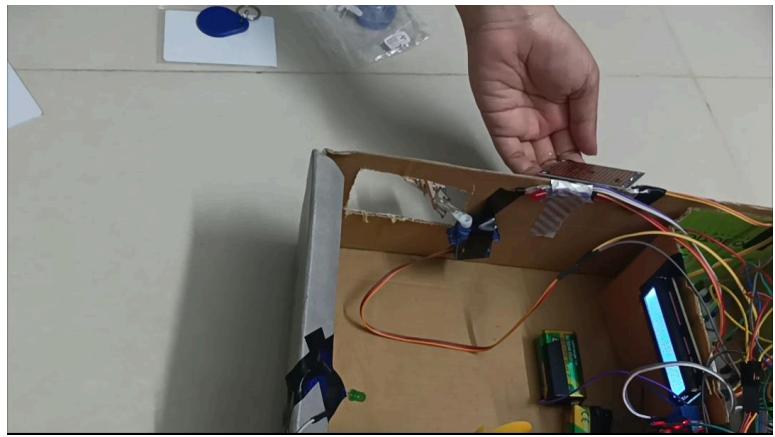


Here, the fan in the system is not activated solely based on high temperature. It only turns on when both conditions are met, which is, the PIR sensor detects human motion and the temperature exceeds a certain threshold. The fan operates in three modes depending on the temperature range: Off, Medium, and High. This ensures energy is conserved and the fan only runs when someone is present and cooling is actually needed. Additionally, the PIR sensor controls a light bulb, which turns on whenever motion is detected. Once triggered, the light remains on for at least 5 seconds before automatically turning off if no further motion is sensed.

Feature 4: Weather-Responsive Clothes Retractor

- **Overview:** Detects rainfall using a rain sensor and automatically protects clothes that are drying outside. When rain is detected, a servo motor rotates a stick that holds the clothes by 90 or 180 degrees to bring the clothes inside or under a shelter, preventing them from getting wet.
- **Working Procedure:** The rain sensor continuously monitors the environment for any signs of rain. When raindrops are detected on the sensor, the system activates a servo motor. The motor then rotates the stick carrying the clothes by 90 or 180 degrees moving the clothes to a protected area or inside the house. This automatic movement helps keep the clothes dry without needing manual intervention.





Here, the rain drops module detects rainfall and automatically protects clothes that are drying outside. The rain drops module continuously monitors the environment for any signs of rain. When raindrops are detected on the sensor, the system activates the servo motor. The motor then rotates the stick carrying the clothes by 150 degrees moving the clothes to a protected area or inside the house. This automatic movement helps keep the clothes dry without needing manual intervention.