Smart Home System

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Introduction

This report explores an innovative smart home system powered by the PIC16F877A microcontroller. Integrating ultrasonic sensor, buzzer, door lock controlled by a servo motor, keypad, KY-026 flame sensor, DC fan motor, and LCD display, the system provides a comprehensive solution for enhanced home automation and security. Emphasizing efficiency, reliability, and user-friendliness. This introduction highlights the integration of these components and their functionalities in creating a modern, smart living environment.

Design

Circuit for our smart home system that contains all sensors and actuators.

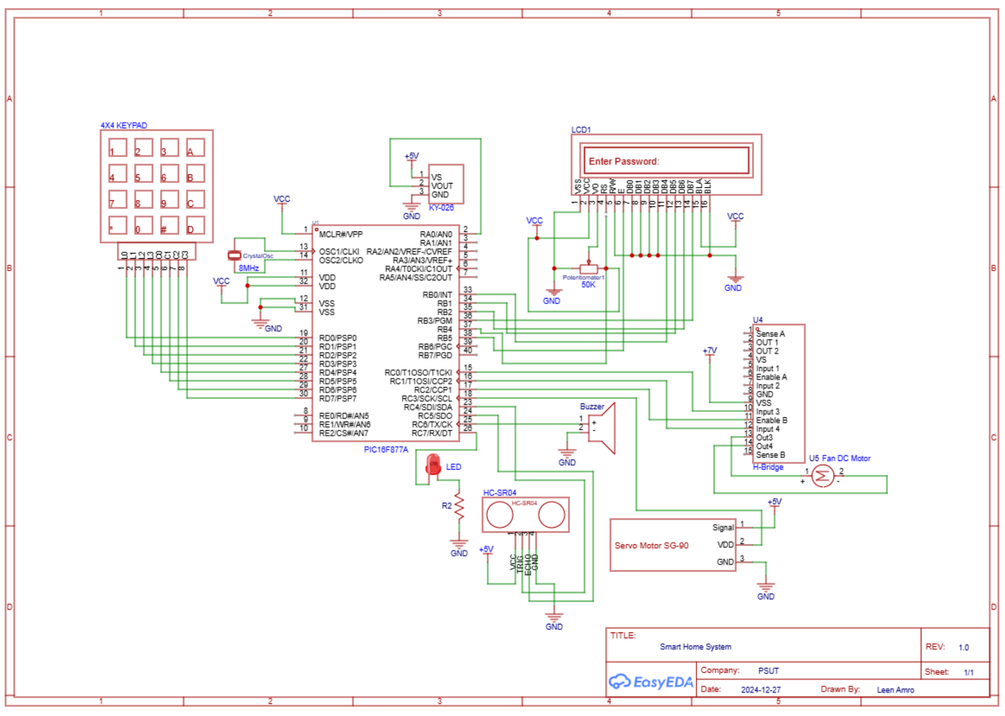

Figure 1: Electrical Design

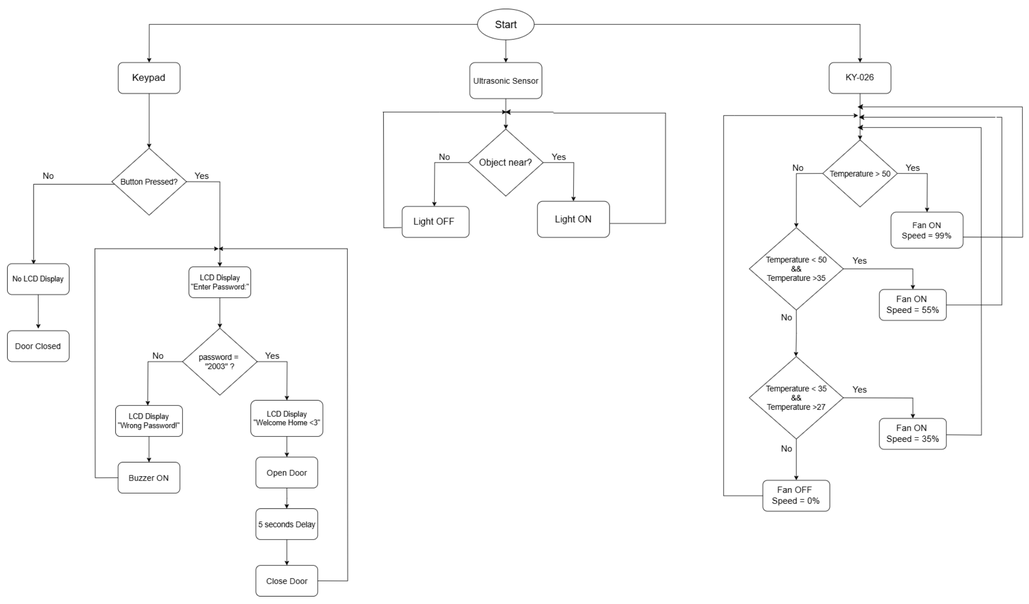

Figure 2: Software Design

Results

The project successfully designed and implemented a smart home system using the PIC16F877A microcontroller. The design incorporated an ultrasonic sensor, a keypad, a flame sensor with a fan control system, and an LCD, providing a secure, automated, and climate-adaptive home environment with all essential functionalities for modern living.

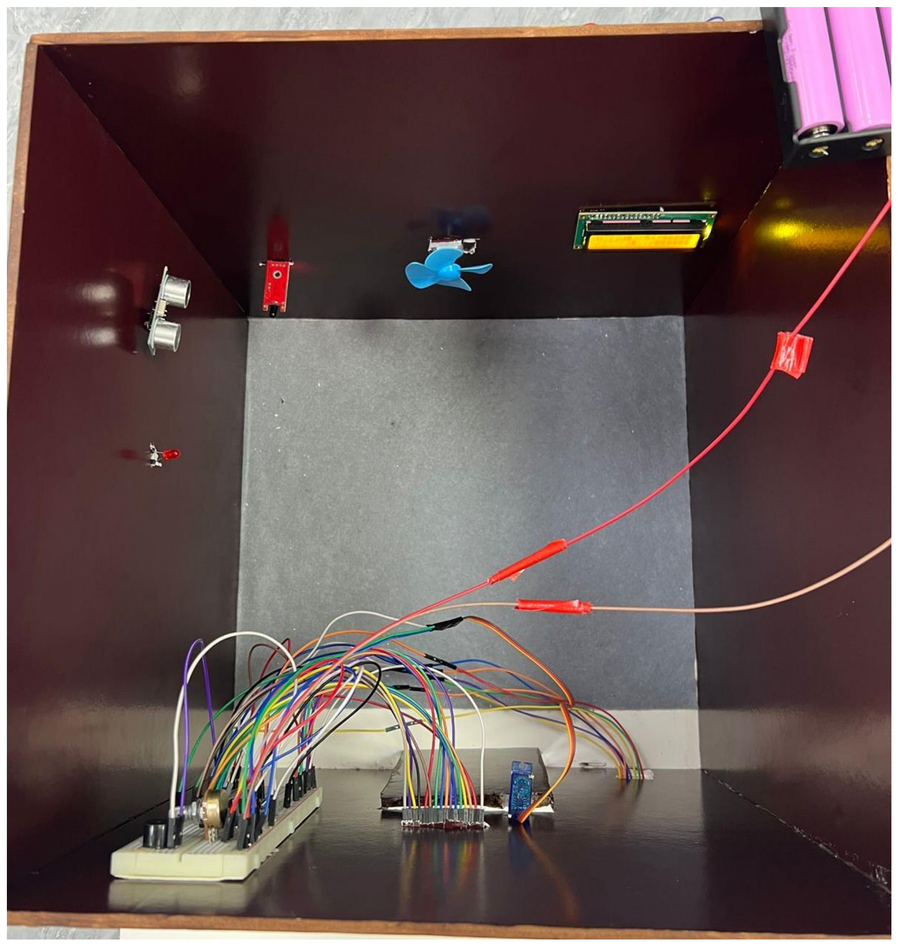

Figure 4: Interior View

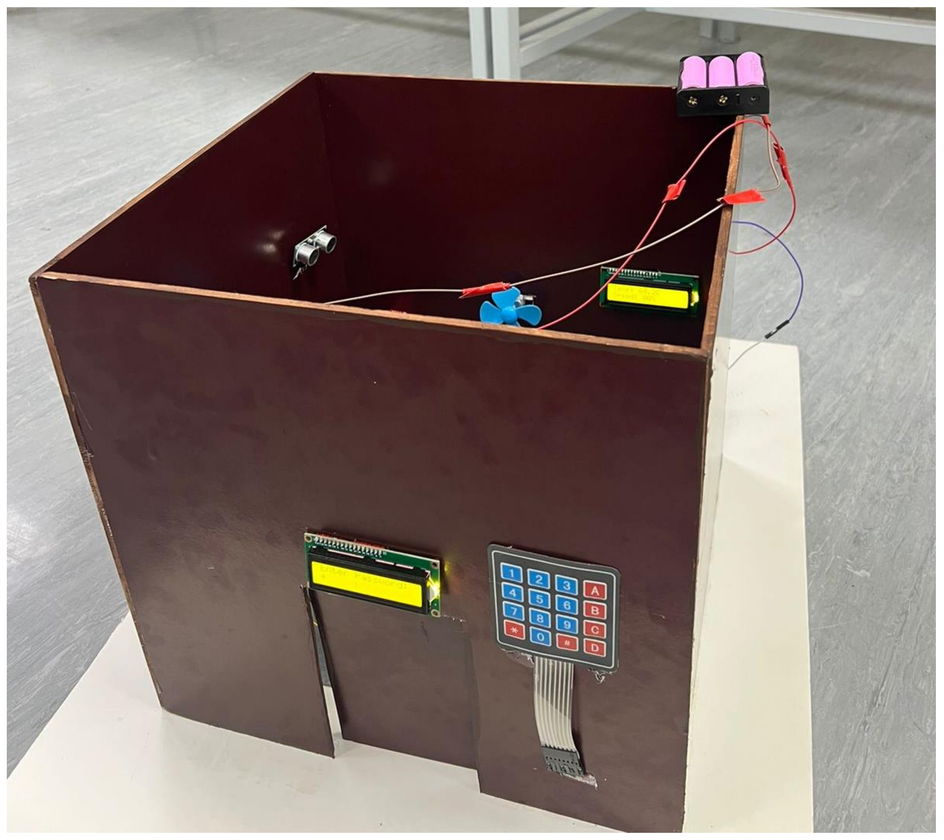

Figure 5: Exterior View

Conclusion

In conclusion, our smart home system integrates advanced technologies for efficient automation and enhanced security. The use of a user-friendly keypad for access control, and an ultrasonic sensor for proximity monitoring highlights our focus on a responsive and interactive design.

The integration of a servo motor for the door lock system ensures secure and convenient door access, while the KY-026 flame sensor and DC fan motor provide adaptive climate control. This system not only prioritizes safety and functionality but also demonstrates a user-friendly approach with an interactive LCD display, making it a versatile solution for modern smart home automation.