EECS 3201 Project Proposal: Home Security System

Syed Mustafa Jamal, Student Number: 217761651
Arthur Sabadini Nascimento, Student Number: 220007175

November 26, 2024

Contents

Abstract

Our project is a home security system. Some of the features of this project are: a mode system to change the security mode, an alarm system that goes off when the door is opened and password saving/changing for the security (passcode is 4 digits long). We should be able to create a physical representation of the idea and run some trials.

Components

- DE10-Lite

  FPGA used. Clock used for synchronization and communication.

- HC-SRO4

  Ultrasonic Distance Sensor, to detect movements and when a door is opened.

- LEDs

  To simulate alarm lights. (one to simulate police notified)

- Seven Segment Displays

  Display messages and operating modes.

System Modes

UNARM (Unarmed)

This mode would disable the alarm system and not trigger anything with the door opening or closing.

ARMS (Armed Stay)

The two 'Armed' modes are triggered when the door is opened. Stay would be for when someone is inside, so if potential internal motion is sensed, they would not trigger the alarm.

ARMA (Armed Away)

Armed Away would be similar to Stay in terms of on entrance/door movement, the user will have 60 seconds to enter the correct passcode; failure to do so will trigger the alarm. After this mode is set, it would also make a smaller sound for some seconds, alerting that it will be ready and it is time to exit.

RESET

Mode to reset the current passcode, the default is 0000. If the passcode is entered, the user is allowed to change the passcode.

System Functionality

The alarm system will go off in the secure 'Armed' mode. When it goes off, a buzzer and red LEDs will flash, alerting that there is a possible infiltration. The homeowner (user) will have 60 seconds to input the passcode and disarm the alarm. Failing to do so would blink a different LED, and for a future development, it could notify you (either through an app or sms) and local security personnel.

External Resources

All design files and proposal reports can be found in this GitHub directory (https://github.com/ArthurSabadini/eecs3201-home-security-system).