

**Program: ESE 4009**

**INSTRUCTOR:** Prof**.** Mike Aleshams

# Group# 4

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**Project Proposal**

**Project Title:**

Home Security System.

**Description of the latest similar system:**

* This project will help to secure places or things from theft by detecting theft right away and it spots the area where motion happened.
* A camera along with raspberry pi will help to take continuous images.
* An IR sensor present in the system will sense the motion and pass the sensed signal to the raspberry pi for finding the detected motion in the camera footage.
* Whenever motion is identified, the system makes use of image processing on the live video to detect theft. It stores the footages in a USB drive for the future reference.

**Limitations of the latest similar system:**

* In the existing system, Raspberry Pi is used that has less processing speed and don’t have built-in hard disk.
* IR Sensor is being used in existing system, which is suitable for shorter sensing range and even affected by hard objects.
* This project is only suitable for some limited areas like personal area surveillance such as personal office cabin.

**Final Solution :**

* **Block Diagram**

POWER

SUPPLY

LPC 2148

CLOUD

STORAGE

WI-FI

MODULE

BUZZER

LCD DISPLAY

CAMERA 2

CAMERA 1

RF RECEIVER

ESP 32

PIR

SENSOR 1

PIR

SENSOR 2

ARDUINO NANO

* **Features**
* **Use of various peripherals such as touch screens, cameras, microphones and speakers, GPIOs, timers, GPS modules, Bluetooth, WiFi, and ADC/DACs?**
* WiFi module, Wireless Cameras and LCD Display are used.
* **Use of I2C, SPI, RS232/RS-485, IrDA infrared, JTAG, USB, Bluetooth, IEEE 802.11 WiFi, IEEE 802.3 Ethernet, CAN and GPS protocols and systems?**
* I2C, SPI, RS232, WiFi
* **Use of preemptive versus cooperative scheduler operation; tick rate and time slicing; critical code; fixed, dynamic and hybrid task priority allocation; application-specific considerations; power management tactics; semaphores, mutexes and queues; debugging strategies; performance estimation?**
* Yes

* LPC 2148 is used in spite of Raspberry Pi as a master Microcontroller.
* ESP 32 is considered as slave device.
* PIR Sensor is used instead of IR Sensors.
* **Hardware Requirement**
* Hardware of a security system consisting of main control board which is driven by a LPC2148 microcontroller.
* ESP32 chip is used for WiFi connectivity.
* PIR Sensors.
* RF Receiver.
* Wireless Cameras.
* LCD Display.
* Buzzer.
* WiFi module
* Power Supply/ Lithium Battery.
* Arduino nano.
* **Software Requirement**
* FreeRTOS.
* Keil Software.
* C language.
* EasyEDA Software For Schematic Diagram.
* AWS for cloud storage.

* **References:**
* Home security. (2020, April 23). Retrieved from <https://en.wikipedia.org/wiki/Home_security>
* Aman Sharma. (2018, March). A Review paper on Smart Home Security System using GSM Module. Retrieved from <https://www.researchgate.net/publication/330498136_A_Review_paper_on_smart_Home_security_system_GSM_module>
* Umera Anjum & B. Babu. (2017). IOT Based Theft Detection using Raspberry Pi. Retrieved from

<https://www.ijariit.com/manuscripts/v3i6/V3I6-1188.pdf>

* Publication, I. A. E. M. E. (n.d.). AUTOMATED SECURITY SYSTEMS. Retrieved from <https://www.academia.edu/43060350/AUTOMATED_SECURITY_SYSTEMS>.
* **Milestones (Deliverables and Time Schedule)**

**Time - 4 Weeks, Total Milestones - 5**

***Requirement Analysis & Ordering components.***

Time Period: June 15 – June 20

By: Stephy

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***Implementation On Circuit Design.***

Time Period : June 21 – June 26

By: Stephy

***Install RTOS in Keil Software & Trying FreeRTOS working.***

Time Period: June 27 – June 30

By: Stephy

***Connecting RF Reciever to LPC2148 & developing code and testing it.***

Time Period : July 1 – July 10

By: Jasmine

***Connection Of Arduino nano and PIR Sensor to RF receiver and it’s coding***

Time Period: July 10 – July 17

By: Diksha

***Interfacing & coding of LCD and LPC 2148.***

Time Period: July 17 - July 23

By: Jasmine

***Interfacing ESP 32-CAM and LPC2148.***

Time Period: July 24 – August 2

By: Jasmine

***Integrating Camera & PIR Sensor. Verifying Software on host system.***

Time Period: August 3 – August 9

By: Diksha

***Communicating Buzzer with LPC 2148.***

Time Period: August 10 – August 15

By: Diksha

***Interfacing of ESP-32 to cloud storage through WiFi & performing final testing.***

Time Period: August 16 – August 21

By: Diksha

**Instructor’s Remarks:**