



JAWAD SHAIID

01-235162-024

MUHAMMAD USMAN NAHEEM

01-235162-065

# Wireless Home Security System

**Bachelor of Science in Information Technology**

Supervisor: Dr.Kashif Naseer

Department of Computer Science  
Bahria University, Islamabad

February, 2021

# **Abstract**

Security and automation is a big problem in our day-to-day lives. The approach to home and industrial automated protection system architecture is now almost standardized. In this project, we have sought to strengthen these standards by integrating modern methodological approaches and designed low-cost home and industrial automated safety systems. Everyone needs to be as safe as possible.

The simple design of Wireless Home Security System can help a customer to easily use this system with a PIR, Smoke, Gas and Window Sensor at Home and Industries. The system is completely controlled by the Arduino microcontroller. Both sensors and detectors are coupled to the microcontroller using a number of interface circuits. The microcontroller watches all sensors constantly, and if it detects any security issues, the microcontroller sends a warning to the smartphone application of the customer. So, that customer can take necessary actions to avoid imminent danger.

# Contents

<b>Abstract</b>	<b>-1</b>
<b>Acknowledgments</b>	<b>0</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Overview . . . . .	1
1.2 Objective . . . . .	2
1.3 Problem Description . . . . .	2
1.4 Methodology . . . . .	3
1.5 Process Model . . . . .	3
1.6 Feature of Proposed System . . . . .	3
1.7 Flow Chart . . . . .	4
1.8 Project Scope . . . . .	4
1.9 Solution Application Areas . . . . .	5
<b>2 Literature Review</b>	<b>6</b>
2.1 Introduction . . . . .	6
2.2 Existing System . . . . .	6
2.2.1 Wireless Home Security System . . . . .	6
2.3 Comparison of proposed and existing System . . . . .	7
<b>3 Requirement Specification</b>	<b>8</b>
3.1 Requirement Specification . . . . .	8
3.2 Functional requirements: . . . . .	8
3.2.1 Sense the Motion . . . . .	8
3.2.2 Sense the Window . . . . .	8
3.2.3 Sense the smoke . . . . .	8
3.2.4 Sense the Gas . . . . .	9
3.2.5 Enable/Disable the Camera Feed . . . . .	9
3.3 Non-Functional requirements: . . . . .	9
3.3.1 Usability . . . . .	9
3.3.2 Reliability . . . . .	9
3.3.3 Scalability . . . . .	9
3.3.4 Accuracy . . . . .	9
3.3.5 Performance . . . . .	9
3.3.6 Flexibility . . . . .	10
3.4 Categorized Users . . . . .	10

3.5	User Cases . . . . .	10
3.5.1	Use Case Diagram of Wireless Home Security System . . . . .	10
3.5.2	Receive Alert Use Case . . . . .	11
3.5.3	Check Sensor Information Use Case . . . . .	12
3.5.4	View Report Use Case . . . . .	13
<b>4</b>	<b>Design</b>	<b>14</b>
4.1	System Architecture . . . . .	14
4.2	Tools/Technology . . . . .	15
4.2.1	Software Requirements . . . . .	15
4.2.2	Hardware Requirements . . . . .	15
4.2.3	Language Used . . . . .	15
4.3	Design methodology . . . . .	15
4.4	Class diagram . . . . .	16
4.5	Summary . . . . .	17
<b>5</b>	<b>System Implementation</b>	<b>18</b>
5.1	Introduction . . . . .	18
5.2	Application Development: . . . . .	18
5.2.1	SDK (Software Development Kit) . . . . .	19
5.2.2	Fire-base (Database) . . . . .	19
5.3	Application Design . . . . .	19
5.3.1	Material Design . . . . .	19
5.4	System Implementation . . . . .	20
5.4.1	PIR Sensor . . . . .	20
5.4.2	Gas Sensor . . . . .	21
5.4.3	Detects the Smoke . . . . .	21
5.4.4	Buzzer . . . . .	22
5.4.5	Deployment Diagram . . . . .	22
5.5	Summary . . . . .	22
<b>6</b>	<b>System Testing and Evaluation</b>	<b>24</b>
6.1	Test Methodology . . . . .	24
6.2	Test Environment . . . . .	24
6.3	Testing Techniques . . . . .	24
6.3.1	Functional Testing . . . . .	25
6.3.2	Non-Functional Testing . . . . .	26
6.4	Test Case . . . . .	27
6.4.1	Receive Alert Test Case . . . . .	27
6.4.2	View Report Test Case . . . . .	27
6.4.3	Send Data To Server . . . . .	28
6.4.4	Detect gas Test Case . . . . .	28
6.4.5	Conclusion of the Test Cases . . . . .	28
6.5	Summary . . . . .	29

<b>7 Conclusion</b>	<b>30</b>
7.1 Overview . . . . .	30
7.2 System overview . . . . .	30
7.3 Milestones Achieved . . . . .	30
7.3.1 Detect the Gas . . . . .	30
7.3.2 Detects the Smoke . . . . .	31
7.3.3 Detects the Motion . . . . .	31
7.3.4 Detects the Window opened . . . . .	31
7.3.5 Activate Camera . . . . .	31
7.3.6 Database . . . . .	31
7.3.7 Limitations . . . . .	31
7.3.8 Summary . . . . .	31
<b>References</b>	<b>31</b>