PROJECT REPORT - INTER DISCIPLINARY

AI-INTEGRATED HOME AND COMMUNITY PROTECTION SYSTEM SUPPORT SDG 11

(PROJECT PHASE- II)

submitted in partial fulfillment of the requirements

for the award of the degree in

BACHELOR OF TECHNOLOGY

By

THANUSH K (211191101159)
SANTHOSH R (211191101131)
PIOUS NIRANJAN.A (211051101615)
DHANUSH RAJ.N (211051101005)

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING & CIVIL ENGINEERING

Dr. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE
DEEMED TO BE UNIVERSITY
University with Graded Autonomy Status
(An ISO 21001 : 2018 Certified Institution)
Periyar E.V.R. High Road, Maduravoyal, Chennai-95. Tamilnadu, India.

APRIL 2025

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DEPARTMENT OF COMPUTER SCIENCE ENGINEERING & CIVIL ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this Project Report (Project Phase-II) is the bonafide work of

Mr. THANUSH K	Reg. No:	211191101159,
Mr. SANTHOSH R	Reg. No:	211191101131,
Mr. PIOUS NIRANJAN A	Reg. No:	211051101615,
Mr. DHANUSH RAJ N	Reg. No:	211051101005,

Who Carried out the project entitled **"AI-Integrated Home and Community Protection System Support SDG 11"** under our supervision from Dec 2024 to Apr 2025.

Internal Guide	Project Coordinator	Department Head
Mrs.A.MAHESWARI **Asst.Professor & Deputy HOD** **Dept of CSE(DS&AI)** Dr. MGR Educational and Research Institute, Deemed to be University	**Mr. M. ARUN** **Assistant Professor** **Dept of CSE** Dr. MGR Educational and Research Institute, Deemed to be University	**Dr. S. GEETHA** **Professor & HOD** **Dept of CSE** Dr. MGR Educational and Research Institute, Deemed to be University
Dr.V. PRIYADARSHINI **Associate Professor** **Dept of CIVIL** Dr. MGR Educational and Research Institute, Deemed to be University	**Dr.T.KAVITHA** **Professor & HOD** **Dept of CIVIL** Dr. MGR Educational and Research Institute, Deemed to be University	**Dr.T.KAVITHA** **Professor & HOD** **Dept of CIVIL** Dr. MGR Educational and Research Institute, Deemed to be University

Submitted for Viva Voce Examination held on _____

Internal Examiner **External Examiner**

DECLARATION

We **THANUSH K (211191101159), SANTHOSH R (211191101131), PIOUS NIRANJAN A (211051101615), DHANUSH RAJ N (211051101005)** hereby declare that the Project Report (Project Phase-II) entitled **"AI-Integrated Home and Community Protection System Support SDG 11"** is done by us under the guidance of **Dr.V.PRIYADARSHINI, Associate Professor & Mrs.A.MAHESWARI, Asst.Professor & Deputy HOD** is submitted in partial fulfillment of the requirements for the award of the degree in BACHELOR OF TECHNOLOGY in Computer Science Engineering & Civil Engineering.

DATE:

PLACE:

1.
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SIGNATURE OF THE CANDIDATE(S)

ACKNOWLEDGEMENT

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CONTENTS

CHAPTER NO	TITLE	PAGE NO
	Title Page	**I**
	Bonafide certificate	**II**
	Declaration	**III**
	Acknowledgement	**IV**
	Contents	**V**
	List of Abbreviations	**VIII**
	List of Figures	**IX**
	List of Tables	**X**
	Abstract	**XI**
	MAJOR DESIGN CONSTRAINTS AND DESIGN STANDARDS TABLE	**XII**
1	**INTRODUCTION**	**01**
	1.1. Problem Statement	**01**
	1.2. Need for IoT and AI-Driven Safety Solutions	**01**
	1.3. Proposed Solution	**01**
	1.4. Significance and Impact	**01**
	1.5. Detailed Explanations of Emergency Scenarios	**02**
2	**LITERATURE SURVEY**	**04**
	2.1 Literature Survey Insight and Inspiration	**04**
	2.1.1 Overview of Literature Survey	**05**
3	**PROPOSED SYSTEM**	**17**
	3.1 System Requirements	**17**
	3.2 Hardware Components	**17**
	3.3 Software Components	**18**
	3.4 Communication Flow	**18**
	3.5 Working Principle	**18**

4 DESIGN & IMPLEMENTATION 19

4.1 PROTOTYPE DESIGN **20**

4.2 TESTING SCENARIOS

4.2.1 GAS LEAK SIMULATION **21**

4.2.2 THEFT BUTTON/ MEDICAL BUTTON **21**

4.2.3 FIRE DETECTION USING FLAME SENSOR **21** **20**

4.2.4 TESTING ACCURACY SCENARIOS **22**

4.2.5 FALSE ALARMS **22**

4.2.6 POWER CONSUMPTION **23**

4.3 DESIGN **24**

4.3.1 DFD Level 0 (Context Diagram) **24**

4.3.2 Level 1 DFD **25**

4.3.3 Level 2 DFD **27**

4.4 UML DIAGRAMS **27**

4.4.1 Use Case Diagram **28**

4.4.2 Class Diagram **29**

4.4.3 Sequence Diagram **30**

4.4.4 Activity Diagram **31**

4.4.5 Communication Diagram **34**

4.4.6 Deployment Diagram **35**

4.5 Implementation Arduino IDE Code **37**

5 RESULTS & DISCUSSION 44

5.1 Case Study **44**

5.1.1 Case Study 1: House 1 and House 2 (Fire Detection) **44**

5.1.2 Case Study 2: House 1 and House 2 (Gas Leak Detection) **45**

5.1.3 Case Study 3: House 1 and House 2 (Theft Detection) **46**

5.1.4 Case Study 4: House 1 and House 2 (Medical Emergency) **47**

5.1.5 Case Study 5: False Alarm and **47**

Acknowledgment Button

6 CHALLENGES & LIMITATIONS 50

6.1 Potential False Alarms **50**

6.2 Wi-Fi & MQTT Reliability **50**

6.3 Large-scale deployment in urban communities introduces challenges **50**

7 CONCLUSION & FUTURE WORK 51

7.1 System Summary & Community Safety Improvement **51**

7.2 Future Enhancements **51**

References 53

LIST OF ABBREVIATIONS

AI	Artificial Intelligence
NLP	Natural Language Processing
IoT	Internet of Things
SDGs	Sustainable Development Goals
MQTT	Message Queuing Telemetry Transport

LIST OF FIGURES

Figure .No	Figure Name	Page.No
4.1	Circuit Diagram & Hardware Setup	18
4.2	TESTING ACCURACY SCENARIOS	21
4.3	Represents Architecture Diagram	22
4.4	Level 0 DFD	23
4.5	Level 1 DFD	24
4.6	Level 2 DFD	26
4.7	Use Case Diagram	27
4.8	Class Diagram	28
4.9	Sequence Diagram	29
4.10	Activity Diagram	31
4.11	Communication Diagram	32
4.12	Deployment Diagram	33
5.1	Prototype Working Model	42
5.2	Case Study 1: Fire Detection	43
5.3	Case Study 2: Gas Detection	43
5.4	Case Study 3: Theft Detection	44
5.5	Case Study 4: Medical Detection	45
5.6	Case Study 5:(False Alarm)	46

LIST OF TABLES

Table.No	Table Name	Page.No
4.1	Response Time for Different Scenarios	21
4.2	False Alarm Rate	22
4.3	Power Consumption Estimates	22

ABSTRACT

Safety in the community is still a major issue in smart city planning, with growing issues of theft, fire risks, gas leaks, and delayed emergency responses. A survey of residential communities in Chennai found that 65.2% of the respondents had theft incidents, mostly in community areas (83.5%), and 55.6% had gas leaks, with 72.8% showing high concern for safety threats. To counteract the limitations, we developed an AI-Based Home and Community Safety System based on IoT-based sensors, real-time communication protocols, and mobile-based monitoring interface. The system consists of flame and gas sensors, OLED display, theft, medical, and false alarm push buttons, and buzzers and LED indicators for notification. A wireless communication framework based on MQTT protocol supports real-time emergency notification among the households to provide immediate response and risk reduction. There is also an IoT dashboard on mobile provided for real-time remote monitoring and controlling of the system, which facilitates ease of access and user interaction. The survey also reflected high community interest in AI-based safety systems with 67.4% considering them to be highly effective and 79.7% willing to trial the system. Prototype testing proved low-latency notifications, efficient hazard detection, and enhanced emergency response systems. The suggested system is in compliance with Sustainable Development Goals (SDG 11 & SDG 9) by increasing the resilience of cities and encouraging smart safety infrastructure.

Keywords: Community safety, AI, IoT, MQTT, Smart cities, Emergency response, Sustainable Development Goals, Urban resilience, IoT dashboard, Remote monitoring.

MAJOR DESIGN CONSTRAINTS AND DESIGN STANDARDS TABLE

Student Group	A.Pious Niranjan (211051101615)	N.Dhanush Raj (211051101005)	K.Thanush (211191101159)	R.Santhosh (211191101131)
Project Title	AI-Integrated Home and Community Protection System Support SDG 11			
Program Concentration Area	Smart cities and Urban Development, Internet of Things (IoT) and AI Integration, Sustainable Development and Resilience			
Constraints Example	Technical Constraints, Cost Constraints, Environmental Constraints, User Adoption and Acceptance Constraints, Maintenance and Support Constraints			
Economic	Yes			
Environmental	Yes			
Sustainability	Yes			
Implementable	Yes			
Ethical	N/A			
Health and Safety	Yes			
Social	Yes			
Political	No			
Other	Power Modulation from Solar Panel			
Standards				
1	ISO/IEC 23894:2023			
2	IEEE 1451			
3	IEEE 802.11			
4	IEEE P2413			
5	NFTA 72			
6	UL268			
Prerequisite Courses for the Major Design Experiences	1. IoT and Smart System Integration 2. Artificial Intelligence for Security Applications 3. Wireless Communication and Networking			