



LIST OF CONTENTS

LEMBAR PENGESAHAN.....	i
PERNYATAAN BEBAS PLAGIASI	ii
PREFACE.....	iii
LIST OF CONTENTS	vi
LIST OF FIGURES	x
LIST OF TABLES	xii
INTISARI.....	xiii
ABSTRACT	xiv
CHAPTER I BACKGROUND	1
1.1 Background.....	1
1.2 Problem Formulation.....	4
1.3 Barrier of the Problem.....	4
1.4 Purpose of the Research	4
1.5 Benefits of the Research.....	4
1.6 Systematics of Writing	4
CHAPTER II LITERATURE REVIEW.....	6
2.1 Research Gap	12
2.2 Novelty	13
CHAPTER III BASIC THEORY.....	14
3.1 Smoke Detector.....	14
3.2 Integrated IoT Mechanism.....	15
3.3 Intelligent Smoke Detector system	16
3.4 Threshold	16



3.5 Early Warning System.....	17
3.6 NodeMCU ESP8266	18
3.7 MQ-2 Gas Sensor.....	18
3.8 Flame Sensor.....	20
CHAPTER IV RESEARCH METHODOLOGY	22
4.1 Methodology.....	22
4.1.1 Data Collection and Sensing.....	22
4.1.2 Data Transmission.....	23
4.2 Tools and Materials	24
4.3 Research Proposal Design	25
4.4 System Design	26
4.5 System Simulation	27
4.6 System Test Plan	30
CHAPTER V IMPLEMENTATION.....	32
5.1 Data Acquisition.....	32
5.1.1 Sensor Parameters	36
5.1.2 Grid Dimensions for 3D Simulation.....	37
5.1.3 Sensor Position.....	37
5.1.4 Distance Calculation.....	38
5.1.5 Fixed Distance Simulation.....	38
5.1.6 Manual Input for PPM and Wavelength	39
5.1.7 Gas Sensor Simulation.....	39
5.1.8 IR Flame Sensor Simulation	40
5.1.9 Create Table for Results.....	40
5.1.10 Display Table.....	41



5.1.11 Visualization.....	41
5.2 Hardware Data Acquisition and Application	43
5.2.1 Library Inclusions.....	45
5.2.2 WiFi Credentials and Bot Configuration	45
5.2.3 Certificate for ESP8266.....	45
5.2.4 Pin Definitions	46
5.2.5 Global Objects.....	46
5.2.6 Setup Function	47
5.2.7 Loop Function	48
CHAPTER VI RESULT AND DISCUSSION.....	49
6.1 Analysis of Gas and IR Wavelength Data on MATLAB.....	49
6.2 MATLAB Detection Result	50
6.2.1 610 ppm and 761 nm Simulation	51
6.2.2 650 ppm and 800 nm Simulation	53
6.2.3 700 ppm and 840 nm Simulation	55
6.2.4 750 ppm and 880 nm Simulation	57
6.2.5 800 ppm and 920 nm Simulation	59
6.2.6 850 ppm and 960 nm Simulation	61
6.2.7 900 ppm and 1000 nm Simulation	63
6.2.8 950 ppm and 1040 nm Simulation	65
6.2.9 1000 ppm and 1080 nm Simulation.....	67
6.2.10 1021 ppm and 1100 nm Simulation.....	69
6.3 System Hardware	71
6.4 System Feedback.....	71
6.5 System Output.....	73



CHAPTER VII	CONCLUSION.....	74
7.1	Conclusion	74
7.2	Suggestion.....	75
REFERENCES	76