

TABLE OF CONTENTS

SHEET STATEMENT OF ORIGINALITY	iii
ABSTRAK	i
ABSTRACT	ii
Table of Contents	i
List of Figures	iii
List of Tables.....	v
List of Terms	vi
Chapter I Introduction	1
I.1 Background	1
I.2 Problem Statement	4
I.3 Research Objectives	4
I.4 Research Scope.....	4
I.5 Research Benefits	4
I.6 Report Systematic.....	5
Chapter II Literature Review.....	7
II.1 Internet Of Things	7
II.2 RaspberryPi	8
II.3 NodeMCU ESP32	10
II.4 Ultrasonic Sensor	11
II.5 Relay Module Actuator	12
II.6 Fuzzy Logic	13
II.6.1 Membership Function	14
II.6.2 Knowledge Base.....	17
II.6.3 Fuzzification.....	17
II.6.4 Inference System.....	19

II.6.5	Defuzzification	20
II.7	Mamdani Fuzzy Inference System	22
II.8	<i>Simpful</i> : Python Library for Fuzzy Logic.....	22
II.9	State-of-the-Art	23
Chapter III	Methods.....	30
III.1	Problem-Solving Framework	30
III.2	Problem-Solving Systematics.....	31
III.3	Data Collection.....	32
III.4	Data Analysis	33
III.5	Evaluation Method	33
III.6	Justification for the Methods.....	33
Chapter IV	Analysis and Design.....	35
IV.1	Analysis	35
IV.1.1	Solution Analysis	35
IV.1.2	Hardware Analysis	35
IV.2	Design.....	36
IV.2.1	System Block Diagram	37
IV.2.2	Fuzzy Logic Node Design.....	38
IV.2.3	Fuzzy Logic Design	40
Chapter V	Testing and Results	48
V.1	Rule Test.....	48
V.2	General Measurement Test.....	48
Chapter VI	Conclusion and Suggestion.....	50
VI.1	Conclusion.....	50
VI.2	Suggestion	51
References	52