

TABLE OF CONTENTS

APPROVAL.....	i
SELF DECLARATION AGAINST PLAGIARISM.....	ii
ABSTRACT.....	iii
ABSTRAK.....	iv
ACKNOWLEDGEMENT.....	v
TABLE OF CONTENTS.....	vi
LIST OF FIGURES.....	viii
LIST OF TABLES.....	ix
CHAPTER 1: THE PROBLEM	1
1.1 Rationale	1
1.2 Theoretical Framework.....	1
1.3 Conceptual Framework/Paradigm	2
1.4 Statement of the Problem	2
1.5 Hypothesis.....	3
1.6 Objectives.....	3
1.7 Assumption	4
1.8 Scope and Delimitation.....	4
1.9 Importance of the Study	5
CHAPTER 2: REVIEW OF LITERATURE AND STUDIES	6
2.1 Wireless Sensor Network (IEEE 802.11.5.4).....	6
2.2 TCP and Routing Protocol	7
2.3 Multipath Routing Network Coding.....	9
2.3.1 Galois Field	12
2.4 Software Simulation Framewok	13

2.4.1	OMNET++	13
2.4.2	MiXiM Framework	15
2.5	Summary	18
CHAPTER 3: RESEARCH METHODOLOGY		1
3.1	Research Design	1
3.2	Software/System Requirement Spesification	19
3.3	Existing Method	20
3.4	Design of Proposed Method	21
3.5	Experiment.....	23
3.5.1	Simulation Design	24
3.5.2	Software Modification	26
CHAPTER 4: ANALYSIS AND DISCUSSION		32
4.1	Performance Metrics	32
4.2	Experimental Result	33
4.2.1	Scenario 1.....	33
4.2.2	Scenario 2.....	36
4.3	Summary of Findings.....	38
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS.....		39
5.1	Conclusions.	39
5.2	Recommendations.	39
REFERENCES		40
APPENDIX.....		42
A.	Lampiran 1	42

LIST OF FIGURES

Fig. 1.	Wireless Sensor Network.....	6
Fig. 2.	Wireless Sensor Network.....	7
Fig. 3.	TCP/IP Stack	8
Fig. 4.	Creating network coding packet at source	10
Fig. 5.	OMNET++ simple and compound module.....	14
Fig. 6.	Running simulation OMNET++ flow chart.....	15
Fig. 7.	Simulation network example of MiXiM	17
Fig. 8.	Node example of MiXiM	17
Fig. 9.	Research Design	19
Fig. 10.	Method comparison.....	23
Fig. 11.	Research Design	24
Fig. 12.	Simulation Process Structure	25
Fig. 13.	Network Topology Skenario 1.....	26
Fig. 14.	Network Topology Skenario 2.....	27
Fig. 15.	A Node Structure	27
Fig. 16.	Run Simulation dialog OMNET++	30
Fig. 17.	Succesful Delivery Ratio of Scenario 1	33
Fig. 18.	Average Energy Consumed of Scenario 1	34
Fig. 19.	Energy Recovery of Scenario 1.....	35
Fig. 20.	Consumed Energy Comparison of Scenario 2	36
Fig. 21.	Average Energy Consumed of Scenario 2	36
Fig. 22.	Energy Recovery of Scenario 2.....	37

LIST OF TABLES

TABLE I. Result Summary of Scenario 1 35

TABLE II. Result Summary of Scenario 2 38