

---

# CONTENTS

<b>REVISION</b>		<b>1</b>
<b>APPROVAL</b>		<b>ii</b>
<b>SELF DECLARATION AGAINST PLAGIARISM</b>		<b>iii</b>
<b>ABSTRACT</b>		<b>iv</b>
<b>ABSTRAK</b>		<b>v</b>
<b>DEDICATION</b>		<b>vi</b>
<b>ACKNOWLEDGMENTS</b>		<b>vii</b>
<b>CONTENTS</b>		<b>viii</b>
<b>LIST OF TABLES</b>		<b>xi</b>
<b>LIST OF FIGURES</b>		<b>xii</b>
<b>LIST OF TERMS</b>		<b>xiv</b>
<b>LIST OF NOTATIONS</b>		<b>xv</b>
<b>1 INTRODUCTION</b>		<b>1</b>
1.1 Rationale . . . . .		1
1.2 Theoretical Framework . . . . .		2
1.3 Conceptual Framework/Paradigm . . . . .		2
1.4 Statement of the Problem . . . . .		3
1.5 Objective and Hypotheses . . . . .		3
1.6 Assumption . . . . .		3
1.7 Scope and Delimitation . . . . .		4
1.8 Significance of the Study . . . . .		4
<b>2 REVIEW OF LITERATURE AND STUDIES</b>		<b>5</b>
2.1 Related Literatures . . . . .		5
2.1.1 Steganography . . . . .		5
2.1.2 Steganalysis . . . . .		6
2.2 Related Studies . . . . .		7
2.2.1 Word2Vec Skip-Gram . . . . .		7
2.2.2 Word Correlation . . . . .		7

2.2.3	TF-IDF . . . . .	8
2.2.4	Context Fitness . . . . .	8
2.2.5	Feature Extraction . . . . .	8
2.2.6	Head-driven Phrase Structure Grammar (HPSG) . . . . .	9
2.2.7	Context-free Grammar (CFG) . . . . .	10
2.2.8	Part of Speech (POS) Tagging . . . . .	11
2.2.9	Steganography T-Lex System . . . . .	12
2.2.10	Quantum Random Number Generator (QRNG) . . . . .	12
2.2.11	Zero-Width Character (ZWC) . . . . .	14
2.2.12	Classification . . . . .	15
<b>3</b>	<b>RESEARCH METHODOLOGY</b>	<b>17</b>
3.1	Research Design . . . . .	17
3.1.1	Preprocessing to fitness value . . . . .	17
3.1.2	Generating sentences for cover text and embedding system . . . . .	26
3.1.3	Extracting System . . . . .	43
3.1.4	Classification System . . . . .	47
3.1.5	Experiment Scenario . . . . .	48
3.2	Population/Sampling . . . . .	48
3.3	Instrumentation and Data Collection . . . . .	51
3.4	Tools for Data Analysis . . . . .	51
<b>4</b>	<b>PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA</b>	<b>52</b>
4.1	Presentation of Data . . . . .	52
4.2	Analysis of the Data . . . . .	53
4.2.1	Embedding Data . . . . .	53
4.2.2	Extracting Data . . . . .	55
4.2.3	Performance Evaluation . . . . .	56
4.2.4	Embedding Capacity . . . . .	59
4.3	Summary of Findings . . . . .	59
<b>5</b>	<b>CONCLUSION AND RECOMMENDATIONS</b>	<b>60</b>
5.1	Conclusions . . . . .	60
5.2	Recommendations . . . . .	60
	<b>BIBLIOGRAPHY</b>	<b>61</b>
	<b>Appendices</b>	<b>62</b>
<b>A</b>	<b>EXPERIMENT RESULT OF EMBEDDING SECRET MESSAGE 3 BIT</b>	<b>64</b>

---

<b>B EXPERIMENT RESULT OF EXTRACTING SECRET MESSAGE 3 BIT</b>	<b>68</b>
<b>C EXPERIMENT RESULT OF EMBEDDING SECRET MESSAGE 4 BIT</b>	<b>72</b>
<b>D EXPERIMENT RESULT OF EXTRACTING SECRET MESSAGE 4 BIT</b>	<b>80</b>
<b>E EXPERIMENT RESULT OF ZERO WIDTH CHARACTER</b>	<b>88</b>
<b>F EXPERIMENT RESULT OF PERFORMANCE MEASURE 3 BIT</b>	<b>89</b>
<b>G EXPERIMENT RESULT OF PERFORMANCE MEASURE 4 BIT</b>	<b>91</b>
<b>H Curriculum Vitae # Example</b>	<b>93</b>