
CONTENTS

APPROVAL	ii
SELF DECLARATION AGAINST PLAGIARISM	iii
ABSTRACT	iv
ABSTRAK	v
DEDICATION	vi
ACKNOWLEDGMENTS	vii
PREFACE	viii
CONTENTS	ix
LIST OF TABLES	xi
LIST OF FIGURES	xii
LIST OF TERMS	xiii
LIST OF NOTATIONS	xiv
1 INTRODUCTION	1
1.1 Background	1
1.2 Theoretical Framework	3
1.3 Conceptual Framework/Paradigm	4
1.4 Research Problem	5
1.5 Objective and Hypotheses	6
1.5.1 Objectives	6
1.5.2 Hypotheses	6
1.6 Assumption	6
1.7 Scope and Delimitation	7
1.8 Significance of the Study	7
2 RELATED WORKS AND THEORETICAL BACKGROUND	8
2.1 Related Literature	8
2.2 BERT	10
2.3 Grey Wolf Optimization (GWO)	10
3 RESEARCH METHODOLOGY	14
3.1 Dataset Description	14
3.2 Pre-processing	15

3.3	Model Development	16
3.4	Evaluation	17
4	DATA PRESENTATION, ANALYSIS, AND DISCUSSION	19
4.1	Presentation of Data	19
4.1.1	Tabular Presentation	19
4.1.2	Textual Presentation	19
4.2	Results and Discussions	20
4.2.1	Baseline BERT	20
4.2.2	BERT Tuned by GWO	22
4.2.3	Comparison with Other Machine Learning Models	25
5	CONCLUSION AND RECOMMENDATIONS	26
5.1	Conclusions	26
5.2	Recommendations	26
	BIBLIOGRAPHY	27
	Appendices	31
A	DATASET AND CODE	33
B	Curriculum Vitae	34