

CONTENTS

APPROVAL PAGE

SELF DECLARATION AGAINST PLAGIARISM

ABSTRACT	i
ACKNOWLEDGMENTS	ii
PREFACE	iii
CONTENTS	iv
LIST OF FIGURES	vi
LIST OF TABLES	vii
LIST OF ABBREVIATION	viii

I INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement	3
1.3 Objective and Contributions	3
1.4 Scope of Work	4
1.5 Hypothesis	4
1.6 Research Methodology	5
1.7 Structure of The Thesis	6
II Basic Concepts	7
2.1 Essay Assessment	7
2.2 Deep Learning on Essay assessment	8
2.3 Convolutional Neural Network (CNN)	9
2.4 Bidirectional LSTM (Bi-LSTM)	12
2.4.1 Bi-LSTM Architecture	13
2.5 CNN + BiLSTM	16
2.5.1 CNN + BiLSTM Architecture	16

III SYSTEM MODEL AND THE PROPOSED DESIGN	19
3.1 Block Diagram of the Proposed Method	19
3.2 System Model	20
3.2.1 Data Collect	21
3.2.2 Preprocessing	22
3.2.3 Splitting Data	23
3.2.4 Model Training	24
3.2.4.1 Hyperparameter	24
3.2.4.2 Kfold Cross Validation	25
3.2.4.3 System Model Architecture	25
3.3 Prediction and Prediction Value	28
3.4 Model Evaluation	29
3.5 Analysis Scenario	30
3.5.1 Analysis of Factors Affecting Model Performance	31
3.6 System Requirements	32
3.6.1 Hardware Requirement	32
3.6.2 Software Requirement	32
3.6.3 Specific Requirement	32
IV PERFORMANCE EVALUATIONS	34
4.1 Hyperparameter Tuning	34
4.1.1 Learning Rate	34
4.1.2 Batch Size	35
4.1.3 Optimizer	37
4.2 Split Sensitivity Test	38
4.3 Model Evaluation	40
4.4 Comparison with Other Models	44
4.4.1 Performance Comparison	45
4.4.2 Effect of Data Augmentation on Model Performance	46
V CONCLUSIONS AND FUTURE WORKS	52
5.1 Conclusions	52
5.1.1 Research Contribution	53
5.2 Future Works	53
REFERENCES	55

Appendices