

TABLE OF CONTENTS

APPROVAL PAGE	ii
ABSTRACT.....	iii
TABLE OF CONTENTS	iv
TABLE OF FIGURES.....	vi
LIST OF TABLE	vii
CHAPTER I INTRODUCTION	1
1.1 Background	1
1.2 Statement of Problem	2
1.3 Objective	2
1.4 Hipotesis.....	3
1.5 Research Method	3
CHAPTER II BASIC CONCEPTS.....	4
2.1 Brain computer interface (BCI).....	4
2.2 Electroencephalography.....	4
2.3 Channel Selection.....	6
2.3.1 Band Pass Filter (BPF)	6
2.4 Feature Extraction.....	7
2.4.1 Welch Method	7
2.5 Independent Component Analysis (ICA).....	8
2.6 Convolutional Neural Network (CNN)	9
CHAPTER III RESEARCH METHODOLOGY	10
3.1 Research Approach.....	10
3.2 System Model Design.....	11
3.2.1 Data Acquisition.....	12
3.2.2 Device Specifications.....	13
3.2.3 Read EDF Case File	13
3.2.4 Filtering using Bandpass Filter.....	13
3.2.5 Perform ICA Decomposition.....	14
3.2.6 Feature Extraction using PSD	15
3.2.7 Classification using CNN.....	17

3.3	Simulation Scenario	18
3.4	Testing Technique.....	22
	CHAPTER 4 RESULTS AND DISCUSSION.....	25
4.1	Result of Reading EDF File Format.....	25
4.2	Result of Pre-Processing Stage.....	29
4.2.1	Filtering Using Bandpass Filter	29
4.2.2	Perform Independent Component Analysis (ICA) decomposition.....	30
4.3	Result of Feature Extraction Process.....	34
4.3.1	Cutting Data per Session	35
4.3.2	Power Spectral Density.....	35
4.4	Result of Classification Process	36
4.5	Testing Result.....	38
	CHAPTER 5 CONCLUSION AND RECOMMENDATIONS.....	42
5.1	Conclusion	42
5.2	Recommendations	43
	REFERENCES.....	44