

Universiti Teknologi MARA

**Sentiment Analysis on Covid-19
Outbreak Using PSO-SVM**

Amir Danial bin Shahrul Sazali

**Thesis submitted in fulfilment of the requirements
for Bachelor of Computer Science (Hons.)**

February 2024

ACKNOWLEDGEMENT

To Allah, praise and gratitude to His Almighty and His greatest blessings, I was able to complete this study within the allotted time frame. First off, I want to express my gratitude to my supervisor, Prof. Madya Ts. Dr. Hamidah binti Jantan. Without her assistance, encouragement, and counsel, it will be impossible to finish my thesis. She spent a lot of time helping me accomplish this study in addition to providing assistance. In addition, I want to sincerely thank Madam Ummu Fatimah Binti Mohd Bahrin, who taught me CSP600 and CSP650. She offered her insightful expertise to me and helped me the entire semester.

I would especially like to thank my family for always being there for me. I will always be grateful to my wonderful parents for their physical and mental assistance. I am also appreciative of my friends for offering me a helping hand when I needed it so that I could successfully complete my final year project.

ABSTRACT

The COVID-19 pandemic has had a huge influence on worldwide society, resulting in widespread lockdowns and considerable changes in everyday life. This project provides the analyzation of attitudes expressed in textual data connected to the COVID-19 outbreak using Particle Swarm Optimization with Support Vector Machines (SVM). This project is driven by the objectives to identify the requirement of Particle Swarm Optimization with Support Vector Machines (PSO-SVM) in sentiment analysis of covid-19 tweets, to apply the PSO-SVM method for sentiment analysis that classified tweets accurately and to evaluate the result of the PSO-SVM model for Covid-19 outbreak sentiment analysis. PSO is an optimization technique by searching decision space by sharing global information between different particles. SVM is a supervised learning model that looks at data for classification by searching hyperplane between classes. The created model achieves 73% accuracy in predicting sentiment of tweets when using a Linear SVM kernel with 70:30 percentage split ratio. The project is set to be improved by using a well-constructed SVM algorithm that can handle large data very well, using a more powerful hardware and unlimiting the language use to train the PSO-SVM.

TABLE OF CONTENTS

CONTENT	PAGE
SUPERVISOR APPROVAL	ii
STUDENT DECLARATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF FIGURES	ix
LIST OF TABLES	xi

CHAPTER ONE: INTRODUCTION

1.1	Background of Study	1
1.2	Problem Statement	3
1.3	Objective	5
1.4	Project Scope	5
1.5	Project Significance	6
1.6	Overview of Research Framework	7
1.7	Conclusion	8

CHAPTER TWO: LITERATURE REVIEW

2.1	Introduction	10
2.2	Sentiment Analysis	11
2.2.1	Overview of Sentiment Analysis	11
2.2.2	Application of Sentiment Analysis	11

2.2.3	Method & Technique Used in Sentiment Analysis	14
2.3	Particle Swarm Optimization (PSO) with Support Vector Machines (SVM)	15
2.3.1	Overview of PSO with SVM	15
2.3.2	Related Works using PSO with SVM	18
2.4	Covid-19 Outbreak	26
2.4.1	Overview	26
2.4.2	Method Used in Covid-19 Outbreak Study	26
2.4.3	Issues & Problem in Study	28
2.5	Similar Works	28
2.6	Implications of Literature Review	33
2.7	Conclusion	34

CHAPTER THREE: METHODOLOGY

3.1	Overview of Research Methodology	36
3.1.1	Detailed of Research Framework	36
3.2	Preliminary Phase	40
3.2.1	Data Collection	41
3.3	Data Preparation	44
3.3	Design Phase	46
3.3.1	System Architecture	46
3.3.2	Flowchart of the Sentiment Analysis System	48
3.3.3	User Interface Design	49
3.3.4	System Implementation Using PSO-SVM	50
3.3.5	System Requirement	54
3.4	Performance Evaluation	55
3.4.1	Accuracy	55
3.4.2	Precision	56
3.4.3	Recall	56
3.4.4	F1 Score	57