UNIVERSITI TEKNOLOGI MARA

EARLY PREDICTION OF DENGUE OUTBREAK USING ARTIFICIAL NEURAL NETWORK (ANN)

MUHAMMAD SIRAJUDDIN BIN ISMAIL

BACHELOR OF COMPUTER SCIENCE (HONS.)

JANUARY 2024

ACKNOWLEDGEMENT

Alhamdulillah, praises and thank to Allah because of His Almighty and His utmost blessings, I was able to finish this research within the time duration given. Firstly, my special thanks go to my supervisor, Madam Noor Hasnita binti Abd Talib, for her invaluable direction, tolerance, and ongoing encouragement. Her knowledge and perceptions have greatly influenced the course of my project. I would like to express my gratitude to Madam Ummu Fatihah Binti Mohd Bahrin, who served as my CSP600 lecturer. Without her advice and encouragement, I might struggle for the entire semester.

A special thank you also goes out to my beloved parents and family. Their steadfast encouragement, support, and comprehension have been the cornerstone of my success. They believed in me and encouraged me, which helped me overcome challenges and cross the finish line. They significantly aided in the development of this project by being present and offering support during trying times. I've been sincerely appreciative of their love, tolerance, and understanding throughout this time.

Finally, I want to express my gratitude to my dear friends for their unflagging support and inspiration as we worked to finish this project. They have consistently been a source of motivation and inspiration. They have offered invaluable assistance, including listening when I was upset and offering wise commentary and recommendations.

ABSTRACT

The dengue fever is a mosquito-borne viral infection that has become one of the world's most quickly spreading and dangerous diseases. To prevent and lessen the impact, effective public health management and control tactics require early dengue epidemic detection and forecasting. This study aims to investigate the requirements of utilizing the Artificial Neural Network algorithm for prediction of dengue outbreak. The objective is to develop Dengue Outbreak Prediction System using Artificial Neural Network algorithm and evaluate its performance. By employing this algorithm, we can analyse historical dengue data, weather conditions, and other relevant factors these may include temperature, humidity, rainfall, and population density to predict potential outbreak accurately. The developed model holds the potential to assist healthcare industry in findings and predictions that can help raise awareness among community members, empowering them to take preventive measures and participate in vector control efforts. This research contributes to the field by exploring the application of machine learning algorithms in the healthcare industry. The results of this study will provide valuable insights into enhancing the efficiency and reliability of dengue outbreak, ultimately benefiting both the healthcare and people around the world.

Keywords: dengue outbreak, healthcare industry, dengue fever, Artificial Neural Network algorithm, prediction model, machine learning.

TABLE OF CONTENTS

CONTENT	PAGE
SUPERVISOR APPROVAL	ii
STUDENT DECLARATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
LIST OF FIGURES	ix
LIST OF TABLES	x
LIST OF ABBREVIATION	xi
CHAPTER ONE: INTRODUCTION	**1**
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Research Question	2
1.4 Research Objective	3
1.5 Project Scope	3
1.6 Project Significance	4
1.7 Overview of Research Framework	5
1.8 Conclusion	6
CHAPTER TWO: LITERATURE REVIEW	7
2.1 Introduction	7
2.2 Prediction System	8
2.2.1 An Overview of Prediction System	8
2.2.2 Application in Prediction System	8
2.2.3 Method & Techniques used for Prediction System	9

2.3 Artificial Neural Network (ANN) 10
2.3.1 An Overview of Artificial Neural Network 10
2.3.2 Algorithm of Artificial Neural Network 11
2.3.3 Related Works using Artificial Neural Network 12
2.4 Healthcare 17
2.4.1 An Overview of Healthcare 17
2.4.2 Method used in Healthcare 18
2.4.3 Issues in this Healthcare 19
2.5 Similar Application 20
2.6 Conclusion 25

CHAPTER THREE: RESEARCH METHODOLOGY 26

3.1 Overview of Research Methodology 26
3.2 Research Phase 26
3.3 Detailed Research Framework 29
3.4 Design Phase 35
3.4.1 System Architecture 35
3.4.2 Flowchart 36
3.4.3 Pseudocode of Selected Algorithm 37
3.4.4 Prototype Implementation 38
3.5 Evaluation Phase 39
3.6 Gantt Chart 41
3.7 Conclusion 42

CHAPTER FOUR: RESULT AND FINDINGS 43

4.1 Conceptual Framework 43
4.2 Program Codes for Algorithm 45
4.3 Prototype interface 51
4.4 ANN Implementation 52