

# DENGUE PREDICTION USING NEURAL NETWORK

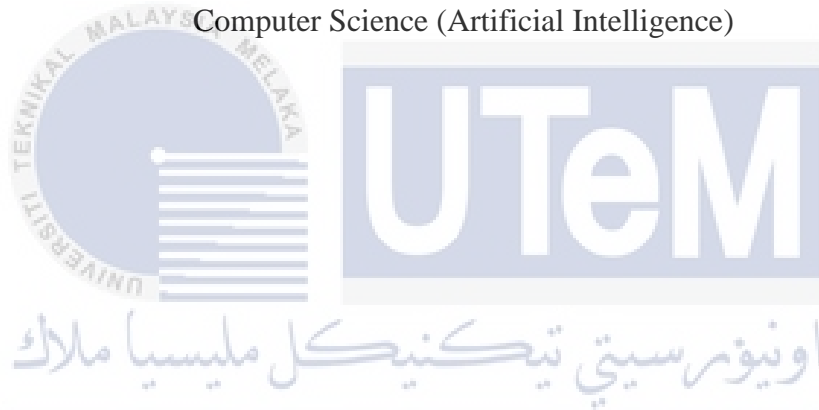


UNIVERSITI TEKNIKAL MALAYSIA MELAKA



NOR ATIKAH BINTI REMLE

This report is submitted in partial fulfilment of the requirement for the Bachelor of  
Computer Science (Artificial Intelligence)



FACULTY OF INFORMATION AND COMMUNICATION AND  
TECHNOLOGY

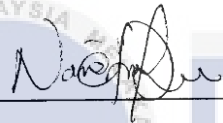
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2017

## DECLARATION

I hereby declare that this project report entitled  
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is written by me and is my own effort and that no part has been plagiarized without  
citations.

STUDENT:



Date: 28/8/2017

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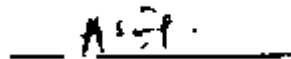


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— I hereby declare that I have read this project report and found  
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this project report is sufficient in term of the scope and quality for the award of

Bachelor of Computer Science (Artificial Intelligence) With Honours.

SUPERVISOR:



Date: 28/8/2017

(PM DR ABDUL SAMAD SHIBGHATULLAH)

## DEDICATION

This project is a dedication for my family especially En. Remle Bin Ayob and Puan Robiah Binti Ahmad, my lecturers and supervisor PM Dr Samad Shibghatullah and Dr Siti Azirah Binti Asmai and friends whom have taught me that everything is achievable as long as there is desire that burn inside. Besides, knowledge is important that do not have an easy way in the process of gaining it and always work hard to achieve success. They are also available by my side and always cheering me up and always helping me in giving idea during this project is being develop.



## ACKNOWLEDGMENTS

Grateful to the Almighty for the countless blessing and grace that was given. I'm finally able to complete the Final Year project for this semester. First and foremost, I would like to gratitude to my supervisor PM Dr Samad Shibghatullah who taught me and worked hard to educate to successfully complete Dengue Prediction Using Neural Network and help in the writing report. Not forgetting, I would like to thank to my parents, lecturers and friends who helped me a lot in finalizing this project within the limited time frame.

## ABSTRACT

Dengue Prediction Using Neural Network (DPUNN) is a system that help user to know the dengue cases and prediction of dengue cases in Malaysia. This system using Artificial Neural Network (ANN) technique to predict the dengue cases. The model of the neural network is used to test for the prediction based on dengue data and to know either NN can solve the problem for dengue prediction. Furthermore, waterfall model is used in the methodology part which have analysis, requirements specification, design, implementation, testing and integration and lastly operation and maintenance to make sure the system is successfully. This system developed using XAMPP, MySQL as database, bootstrap as a template and other software which is include Adobe Photoshop CS6, Matlab and Microsoft Project 2007. Other than that, this DPUNN evaluate the performance of dengue prediction application using real dengue data in Malaysia. Then, after evaluation it will correct the model accordingly and use the model to put in the system. Lastly, this system can make user alert to the dengue cases on their current state.

## ABSTRAK

Dengue Prediction Using Neural Network (DPUNN) adalah satu sistem yang membantu pengguna untuk mengetahui kes denggi dan ramalan kes denggi di Malaysia. Sistem ini menggunakan Artificial Neural Network (ANN) teknik untuk meramalkan kes denggi. Model rangkaian neural digunakan untuk ramalan berdasarkan data denggi. Tambahan pula, Waterfall Model digunakan dalam bahagian metodologi yang mempunyai analisis, spesifikasi keperluan, reka bentuk, pelaksanaan, ujian dan integrasi dan operasi akhir sekali dan penyelenggaraan untuk memastikan sistem ini dengan jayanya. Sistem ini dibangunkan dengan menggunakan XAMPP, MySQL sebagai pangkalan data, bootstrap sebagai template dan perisian lain yang termasuk Adobe Photoshop CS6, Matlab dan Microsoft Project 2007. Selain daripada itu, DPUNN ini menilai prestasi aplikasi ramalan denggi menggunakan data denggi sebenar di Malaysia. Selepas penilaian dibuat, ia akan membetulkan model dengan sewajarnya dan menggunakan model untuk dimasukkan ke dalam sistem. Akhir sekali, sistem ini boleh membuat amaran pengguna kepada kes denggi pada keadaan mereka. membuat amaran pengguna kepada kes denggi di lokasi semasa mereka.



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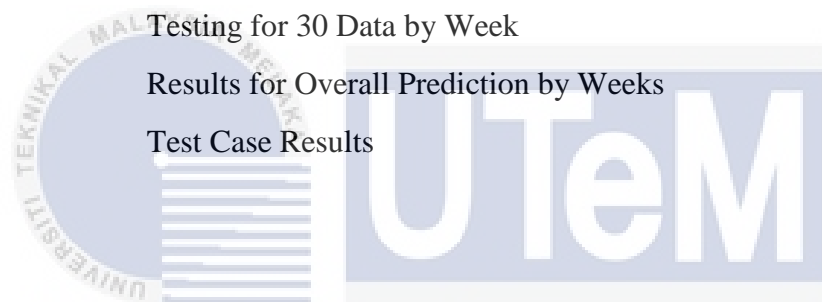
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## LIST OF ABBREVIATION

DPUNN	➤ Dengue Prediction Using Neural Network
MySQL	➤ My Structure Query Language
PHP	➤ Hypertext Pre Processor
ANN	➤ Artificial Neural Network
NN	➤ Neural Network



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## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction



Dengue is the vital disease in the world especially in Malaysia. These diseases like dengue fever cases have been reported in Malaysia particularly Selangor that has the highest number of cases. Dengue fever are comes from the Aedes aegypti mosquito that transmit these dangerous disease. Female mosquito bite humans and use the nutrients in blood to produce their eggs. The characteristics of Aedes aegypti are having a black body with white stripes all over mosquito body, having ability to fly up to 100 meters to 400 meters from where the mosquito hatch, the mosquito requires blood every two days and have ability to survive for 2 until 3 months with an average 2 weeks.

Dengue Prediction Using Neural Network (DPUNN) is a system that stated about the dengue cases and the number of cases in Malaysia. This system also will predict the number of cases that will happened and will know the current cases based on current state. This system developed to solve the problem about the trend of the dengue data and the technique to test the dengue data.

By build the Dengue Prediction Using Neural Network (DPUNN) it can give the community to know the highest states that have dengue cases around Malaysia by using prediction model. Other than that, community also will know the prediction for dengue cases for the other day. So community will be aware to the dengue to will be occur at their current state. This Dengue Prediction Using Neural Network (DPUNN) using Neural Network technique to get the most accuracy of the data by prediction.

Besides, Dengue Prediction Using Neural Network (DPUNN) can display the map for the current location for the community. It will make easier for community and will come out with alert message for the current location. This system also using PHP (Hypertext Preprocessor) language.



## 1.2 Problem Statement

There are a lot of technique that can be used for prediction. The trend and pattern of the dengue data is difficult to analyse. The problem that was finding out before doing this Dengue Prediction Using Neural Network (DPUNN) is about the trend of the dengue itself and also there is no dengue prediction app in Malaysia. Here discuss with the problem statement that happened in the real life and prove that Dengue Prediction Using Neural Network (DPUNN) can solve the problem

### **Problem Statement 1: The trend of the dengue**

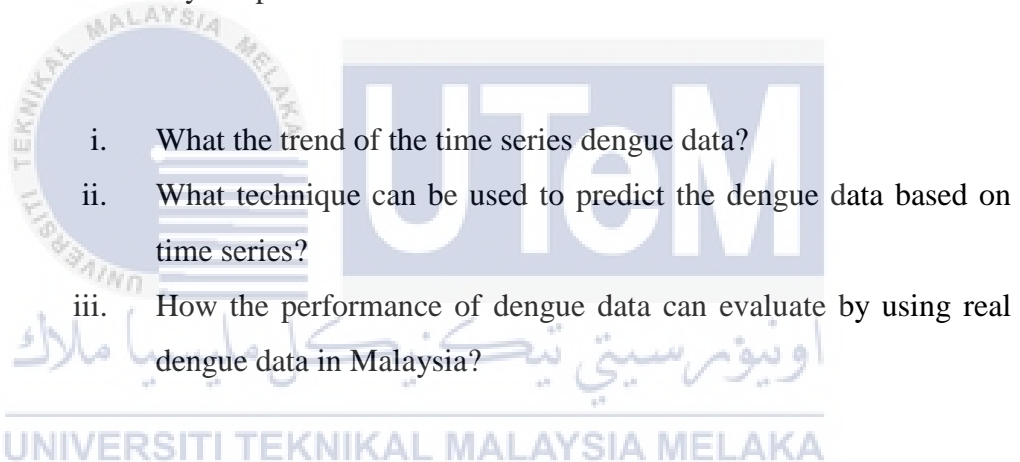
The problem come out which is did not know the trend of the dengue data that is difficult to analyse and to know the pattern of the data.

### **Problem Statement 2: No prediction dengue cases in Malaysia**

The problem come out because there are no prediction dengue cases in Malaysia and dengue prediction system to show the prediction of the dengue that happened in Malaysia.

#### 1.3 Project Question

Project Questions are based on Problem Statements. The purpose of Project Question is to identify the problem statement.



- i. What the trend of the time series dengue data?
- ii. What technique can be used to predict the dengue data based on time series?
- iii. How the performance of dengue data can evaluate by using real dengue data in Malaysia?

#### 1.4 Objectives

Based on the project questions discussed in the previous section, Project

Objectives has been issued as follows.

- i. To analyse and propose a dengue prediction technique based on the series of dengue data by using Neural Network technique.
- ii. To develop the mobile application of dengue prediction for community use.

- iii. To evaluate the performance of dengue prediction application using real dengue data in Malaysia.

### 1.5 Project Scope

In this project, it will predict the dengue cases by using real data. This project is divided the scope into some categories as below.

- a) Data
  - i. Data set is a collection of data where every attribute of data represents variable and each instance of its own description. For this project, real dengue data set in Malaysia are used to predict the dengue that get from Ministry of Health(MoH)
- b) Study area
  - i. Area that recovered in this project are dengue in Malaysia which is Kedah, Perlis, Pulau Pinang, Perak, Selangor, Melaka, Negeri Sembilan, Kelantan, Terengganu, Pahang, Johor and Kuala Lumpur.
- c) Technique
  - i. Prediction technique that will be used is Neural Network technique.

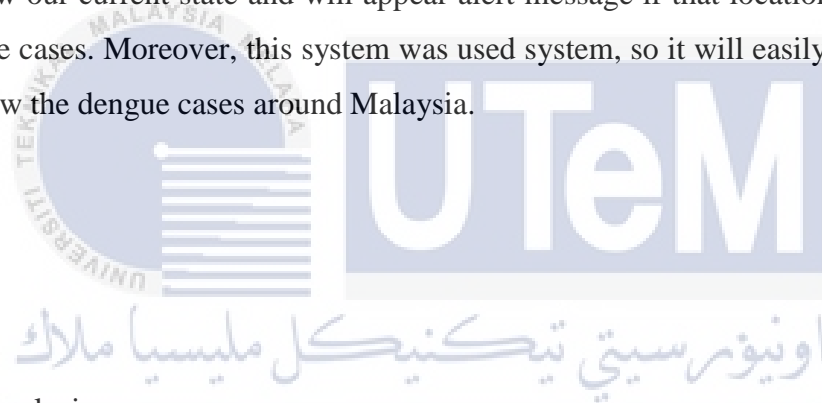
### 1.6 Project Significance

Prediction model to be developed is very complicated thing to do. This is because, it will get a lot of results that must take the best accuracy for the result test. To get the best decision, we must choose the best data. By using this system, it will

get the model that test by using Neural Network technique and come out with the prediction for dengue cases in Malaysia.

### 1.7 Expected Output

Since the system is an intelligent system, the prediction model must be the best and accurate for this system. Additionally, the system was used Neural Network prediction technique to develop the prediction model. The prediction technique will predict the dengue cases for the next day. Besides, this system used geometry which is show our current state and will appear alert message if that location is the highest dengue cases. Moreover, this system was used system, so it will easily to community to know the dengue cases around Malaysia.



### 1.8 Conclusion

In this chapter, problem statement, objective and scope of this project are clearly identified. The next chapter will discuss the related work of this project which is literature review and the project methodology. It can summarize the main concern of this project, study previous approaches that used to build Dengue Prediction Using Neural Network.

## CHAPTER II

### LITERATURE REVIEW AND PROJECT METHODOLOGY



#### 2.1 Introduction

This chapter tells in details about Literature Review and Project Methodologies. Literature review describe the background of the project proposed which is the Dengue Prediction Using Neural Network (DPUNN). Besides, this chapter provides summary and evaluation of the previous research that relate to the project that can be developed. The purpose of the literature review is to justify the exact choices of research or a project. Moreover, it exposes the important of the topic or the system to be developed. Furthermore, in order to understand of the project, literature review can assist to gather the background information needed. It functions as the key to show readers that the developer of the system is familiar with significant and the latest research that is relevant with the topic. Literature review provides chance to discover what has been investigated and what has not and also to discover how the project is related to the work with others.

Methodology is a methodology process of activities that is use to developed the system. Methodology has phases which crawls phase by phase to develop the

system until finished. Each step of this phase is show by modelling it. There are two common methodologies that always has been implemented during developing which is Object Oriented Analysis and Design (OOAD) and Structured System Analysis and Design Method (SSADM).

## 2.2 Facts and Findings

Nowadays, people are getting used to acquiring information through mobile platforms due to the popularity of smartphone and accessibility of wireless networks. For instance, they use smartphone to get information, shopping, navigation and communication as well. Currents mobile system increasingly powerful in term of providing a wide variety of services. Most of the time, simple installation of several apps can meet people's most daily need (Philip Guo, 2015).

Dengue is a threatening caused by female mosquitos. It is typically found in widespread hot regions. From long period of time (Kamran Shaukat,2015). As we know, dengue fever is an infectious disease. Dengue fever can cause high fevers, rashes, pain throughout the body and headaches. In other cases, dengue fever can turn into something serious know as dengue haemorrhagic fever. This is worse cases if someone get this fever it will cause bleeding, belly pain and even death. Dengue fever is common in tropical and subtropical climates. It is a big problem in some countries in Latin America and Southeast Asia.

This section describes the types of software, hardware and brief he descriptions. These requirements can collaborate to develop the project which is Dengue Prediction using Neural Network.

### 2.2.1 Domain

Dengue Prediction Using Neural Network is about to know the trend of time series dengue data. Other than that, DPUNN will know the prediction of dengue cases

based on the series of dengue data. Besides, this project can show user where their current state to know the current cases at their current state. This DPUNN will predict the dengue cases based on current dengue cases. Based on this prediction, user may know the prediction of the dengue that will be happened by using Neural Network technique.

### 2.2.2 Existing System

There are a few existing prediction systems that is using in Malaysia that closely related to the system that going to developed. In order to gain the better point that used to developing this system, those the existing system that can give good use for guiding and coming up the better ideas to improve the newly created system which is Dengue Prediction Using Neural Network.

#### 2.2.2.1 AccuWeather

This AccWeather website was built by American company that provides commercial weather forecasting services. It was founded by Joel N.Myers in 1962 at Pennsylvania State University from graduate student that working on a degree in meteorology. This AccWeather can forecast the weather around the world. It can be view from the computer or by mobile phone. This website may forecast the weather for 3 days, a week and a month. Other than that, it will detect our current location when we launch the website by using mobile phone.

- <http://www.accuweather.com/en/asia-weather>