Application of Neural Networks with the Suspension of Classes

CPELEC1 – Project

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*Abstract*— to be able to create a program where it would monitor the typhoon’s rainfall, pressure, and wind speed. This would result into creating a machine in order to predict the program whether classes would be suspended in some areas of manila. This would benefit everyone since it has the capability to check how strong the typhoon will be thus predict if it would result into having a numerous disasters to the areas of Manila.

Keywords—Typhoon, Artificial Neural Network, image processing, suspension, disasters

# Introduction

Artificial neural networks (ANN) are a popular tool in machine learning especially in predicting and classifying several data. ANN adapts from the given data to construct appropriate functions for a specific task. The purpose of neural networks allows advantages like adaptive learning, self-organisation, real time operation, and fault tolerance via Redundant Information Coding. This could provide projections where it develops better solutions of the situations.

For this project, Fast ANN, an ANN library, will be used in order to predict whether suspensions in Manila would occur. The dataset consists of records from past typhoons that entered the Philippines. The input parameters are information about a typhoon such as maximum wind speed and lowest pressure. The output will result to either 1 or 0, making this project a binary logistic regression application of FANN. This would allow the program to predict whether the strength of the winds, pressure, and etc. result into damages of the area in Manila. The program would show whether there is suspension or not.

Objectives

* To be able to execute the Artificial Neural Network on the program
* To be able to accomplish the Artificial Neural Network on a problem within the Manila
* To allow the program to decide where there are suspension of work/classes or not in Manila

# methodology

For this program to be implemented within Manila, it would be created with the help of researching the list of typhoons that have passed through the area of Philippines. These would consist of all the factors it contains such as its rainfall, pressure, wind speed, and etc. To be able to create a program, it is necessary to implement the C programming language in the LINUX Operating System. The input of data will be the factors of the typhoon where it would scan through and predict the possible damages of the area. The given data of the typhoons are retrieved from the previous databases of the NASA, News Networks, PAGASA, and etc. in Manila. With these requirements being accomplished, the program therefore announces whether there is a suspension or not

# Data and Results

DATASET INFORMATION

Parameters:

X1 – Wind speed (kph)

Highest maximum sustained wind recorded.

X2 – Pressure (hPa)

Lowest pressure recorded.

X3 – Rainfall (mm)

Nearest and maximum rainfall recorded.

X4 – Quarter

1 for January-March,

2 for April-June,

3 for July-September,

4 for October-December.

If storm is between two months, consider month at which storm is closest to Manila.

X5 – Manila Hit

Did diameter hit Manila?

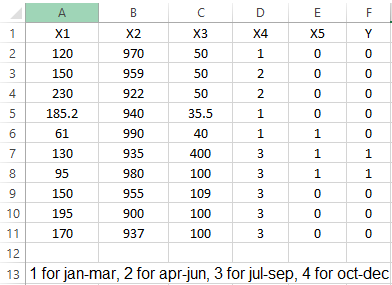
Y – Manila Suspend

Did classes in Manila suspend during the storm?

Scope:

- Dataset only includes tropical storms and typhoons that have local names.

- Dataset is obtained from significant reports, i.e. reports with most extreme records and occurred nearest to Manila.



As of now there are 10 samples but through the course of the project more samples will be added in order to have more training and ultimately achieve the requirements.

# Analysis and Conclusion

# List of typhoons:

# 1 – Typhoon Mekkhala (Amang – jan 2015)

# http://weather.com.ph/announcements/typhoon-mekkhala-amang-update-number-012

# http://www.gmanetwork.com/news/story/409136/news/regions/walang-pasok-list-of-areas-with-class-suspensions-due-to-amang

# 2 – Typhoon Maysak (Chedeng – apr 2015)

# http://weather.com.ph/announcements/typhoon-maysak-chedeng-update-number-012

# 3 – Super Typhoon Noul (Dodong – may 2015)

# http://weather.com.ph/announcements/super-typhoon-noul-dodong-update-number-022

# 4 – Typhoon Higos (feb 2015)

# https://www.nasa.gov/content/goddard/higos-northwest-pacific-ocean

# 5 – Tropical Storm Betty (mar 2015)

# https://www.nasa.gov/content/goddard/bavi-nw-pacific-ocean/

# 6 – Typhoon Falcon (July 2015)

# http://pagasa.dost.gov.ph/index.php/139-tropical-cyclones/severe-weather-bulletin/falcon-2015-bulletin/1152-6

# 7 – Tropical Storm Egay (July 2015)

# https://web.pagasa.dost.gov.ph/index.php/tropical-cyclones/weather-bulletin

# 8 – Typhoon Goring (July 2015)

# http://www.gmanetwork.com/news/story/528122/scitech/weather/pagasa-typhoon-goring-exits-par-weakens-further

# 9 – Typhoon Hanna (July 2015)

# http://cnnphilippines.com/news/2015/08/05/Typhoon-Hanna-to-bring-moderate-to-heavy-rain.html