Presentation code:

E2

Early Prediction System Using Neural Network in Kelantan River, Malaysia

Mohd Azrol Syafiee Anuar[1,*], Ribhan Zafira Abdul Rahman[1], Samsul Bahari Mohd[1], Azura Che Soh[1], Zed Diyana Zulkafli[2]

[1]Department of Electrical and Electronic Engineering, Faculty of Engineering, Universiti Putra Malaysia 43400 UPM Serdang, Selangor, Malaysia
[2]Department of Civil Engineering, Faculty of Engineering, Universiti Putra Malaysia 43400 UPM Serdang, Selangor, Malaysia

*Corresponding author's e-mail: azrolsyafiee93@gmail.com

Abstract. Flood is a major disaster that happens around the world. It has caused the loss of many precious lives and destruction of properties. The possibility of flood can be determined by many factors that consist of rainfall, water flow rate and water level. This project aims to design a water level prediction system which is used to analyse the Kelantan River water level based on Sokor River, Galas River and Lebir River Flow rate and rainfall of at Ladang Kuala Nal and Ladang Kenneth. The system utilizes neural networks in predicting the water level for 5 hours ahead. This system has 5 inputs and 1 output prediction. This prediction system focuses on comparing the conventional method and the NNARX system in the determining the possibility of flood. The result shows that the NNARX have higher performance in predict the water level of Kelantan River in comparing to the conventional method. The performance of the system is based on the value of the means square error (MSE). The MSE of the conventional method is 0.2250 meanwhile for NNARX is 1.342×10^{-4}. In ensuring the NNARX model capability and flexibility, another case study was tested with same of input and output but with different period. The performance for the model is 3.917×10^{-4} and is proven it can be used to different set of data.

Keywords: Neural Network; Neural Network Autoregressive with Exogenous Input (NNARX); Flood Prediction Model.