

ABSTRAK

Indonesia memiliki 2 musim, yaitu musim kemarau dan musim hujan. Pada saat musim hujan banyak di beberapa titik wilayah DKI Jakarta mengalami banjir ataupun genangan. Adapun penyebab Jakarta sering mengalami banjir disebabkan oleh beberapa faktor antara lain banjir hujan lokal, banjir kiriman dan banjir rob. Dinas Sumber Daya Air DKI Jakarta saat ini belum memiliki sebuah sistem yang dapat memprediksi ketinggian air dimasa mendatang dengan mengacu pada data ketinggian air dimasa lalu dan saat ini. Melalui latar belakang tersebut penulis mencoba melakukan penelitian di salah satu pintu air wilayah utara DKI Jakarta dalam memprediksi ketinggian air dengan menggunakan metode *deep learning* yaitu *Recurrent Neural Network* (RNN) dan *Long Short Term Memory* (LSTM). Tujuan penelitian ini adalah menganalisa model *deep learning* terbaik dan melakukan prediksi data deret waktu ketinggian air. Dari hasil analisis yang dilakukan didapatkan model *deep learning* terbaik yaitu *Long Short Term Memory* (LSTM) dengan menggunakan beberapa pengujian seperti n-input, data split dengan komposisi data *train* 90,33% dan data *test* 9,67%, serta pengujian parameter yang berbeda antara lain *epoch*, *batch size*, *learning rate*, *dropout* maka, didapatkan hasil dengan nilai *error* terendah dengan RMSE (17.65), MAPE (0.29), MAE (3.37) dan waktu yang dibutuhkan dalam proses (*runtime*) yaitu 39 menit.

Kata kunci : *Deep Learning*, *Long Short Term Memory* (LSTM), *Recurrent Neural Network* (RNN), data deret waktu ketinggian air.

ABSTRACT

Indonesia has 2 seasons, namely the dry season and the rainy season. During the rainy season, many points in the DKI Jakarta area experience flooding or inundation. The reason why Jakarta often experiences flooding is caused by several factors, including local rain floods, shipment floods and tidal floods. The DKI Jakarta Water Resources Agency currently does not have a system that can predict future water levels by referring to past and present water level data. Through this background, the author tries to conduct research in one of the floodgates in the northern area of DKI Jakarta in predicting water levels using deep learning methods, namely Recurrent Neural Network (RNN) and Long Short Term Memory (LSTM). The purpose of this research is to analyze the best deep learning models and predict water level time series data. From the results of the analysis carried out, the best deep learning model is Long Short Term Memory (LSTM) using several tests such as n-input, split data with a composition of 90.33% train data and 9.67% test data, as well as testing of different parameters including epoch, batch size, learning rate, dropout, so the results obtained are the lowest error values with RMSE (17.65), MAPE (0.29), MAE (3.37) and the time needed in the process (runtime) is 39 minutes.

Keywords : Prediction of water level Deep Learning, Long Short Term Memory (LSTM), Recurrent Neural Network.