Abstract

Sea level forecasting is very important for coastal engineering construction, such as for analyzing the discharge and movement of sediments, tracers and pollutants, offshore engineering construction, environmental observation, as well as for ship navigation of many coastal engineering constructions. Sea level forecasting is very helpful for all operations that take place at sea. In many applications in coastal engineering practice, sea level is approximated by the tidal level. This is based on the fact that tides are the most predictable oceanographic phenomenon. In writing this final project, we propose a deep learning approach, namely the Gated Recurrent Unit (GRU) method and the Bidirectional Long Short-Term Memory (BiLSTM) method. We used 3-month sea level data in Pangandaran, West Java, Indonesia. As training data, we only used two months to train the model, to predict the next 3, 5, 7, 10, and 14 days. Prediction results obtained using BiLSTM show relatively very good results with CC values greater than GRU and RMSE, MAE errors in BiLSTM smaller than GRU. This is because BiLSTM can perform better computations by performing input data twice (ie, 1) left to right (forward layer) and 2) right to left (backward layer)). The results show that BiLSTM provides better performance than GRU when predicting short-term sea level data

Keywords: Bidirectional Long Short-Term Memory, Sea Level, Gated Recurrent Unit, Tides, forecasting.