
Abstract

Sea level forecasting is vital in coastal activities, such as engineering and naval navigation. Moreover, it can be used for making strategies for future coastal development and planning, and also for mitigating its serious consequences. Traditional sea level forecasting, such as tidal harmonic analysis, do not consider a non-tidal component contribution in the sea level forecasting. In this study, we use a deep learning approach to forecast sea level. We use three deep learning methods: the Recurrent Neural Network (RNN), the Long Short Term Memory (LSTM), and the Bidirectional Long Short Term Memory (BiLSTM). These three methods of deep learning are compared to show their performances to forecast the sea level for 48 h, 72 h and 168 h ahead. We use the sea level data obtained from observation at Jakarta Port, Indonesia, as our study case. The results of the numerical experiment show that the BiLSTM method gives better performance than the RNN and the LSTM. The BiLSTM improve performance than the other two methods due enables additional training by traversing the input data twice (i.e., 1) left to right and 2) right to left.

Keywords: Sea Level, Forecasting, RNN, LSTM, BiLSTM.
