Abstract
Sea level forecasting is useful for many coastal applications, such as navigation, coastal operation, etc. One of many challenges in sea level forecasting is the availability of its historical data. Limited amount of historical data may lead to inaccurate prediction. Especially when using tidal harmonic analysis, low frequency components cannot be captured in short term historical data. In this paper, we present an application of a deep learning approach for sea level forecasting, especially with limited amount of historical sea level data. We use the so-called Long Short Term Memory (LSTM) method to forecast the sea level. We use two months of historical data, to forecast 7 days up to two months ahead. As a study case, we use the sea level data that is recorded in Tanjung Benoa, Bali, Indonesia. To investigate its accuracy, we compare results of forecasting by using the LSTM with the traditional method tidal harmonic analysis that uses Least Square Estimation (LSE) method. Moreover, we also compare the LSTM method with feedback and no-feedback. The results of forecasting by using LSTM with feedback results in accurate prediction, with R value of 0.99.
Keywords: *Sea Level, Limited Historical Data, Long Short Term Memory Networks (LSTM)*