

# Development of RNN-LSTM-based Tropical Cyclone Track Prediction Scheme over the western North Pacific

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Tropical cyclones (TCs) are one of the most threatening natural disasters in the world, and TC forecasting is essential for disaster prevention in coastal areas caused by storms. In particular, TC track information is the most basic and important information among TC prediction parameters. Currently, the accuracy of TC track forecasting has been significantly improved with advances in observation and numerical weather prediction (NWP) skill. The Korea Meteorological Administration (KMA) provides the TC forecast every 12-hour intervals based on the post-processed observations and NWP forecasts, which are updated every 4-8 hours, for predicting the TC track. However, the track forecasting in the NWP with a long update cycle has difficulties in real-time for use by forecasters. This study aims to develop the recurrent neural network (RNN)-Long short term memory (LSTM)-based TC track prediction scheme over the western North Pacific for updating the real-time TC forecasting. The RNN-LSTM model is frequently used to build the time series-based prediction model because it can capture and remember the characteristics of time series with long- and short-term periods. For model training, we used the TC track related parameters from the present to before 36 hours by each TC in the RSMC-Tokyo best track during 1951-2021. The RNN-LSTM model was tested for predicting the 6 to 72-h times at 6 hourly interval and was optimized through sensitivity test for TC track-related parameters.

Key words: Tropical cyclone, TC track prediction scheme, RNN-LSTM

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