Tropical Cyclone Intensity Propagation Using Deep Learning

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Abstract: *A cyclone is an example of an intense tropical weather event that can have catastrophic effects on places in transit. Since cyclones have very high dynamics and uncertainty, long-term forecasting of cyclones is a difficult subject. However accurate cyclone track predictions essential to minimizing mortality and damage. Current cyclone track forecasting techniques suffer from high computational complexity and poor long-term forecasting power because they primarily use a single modality of source data. therefore, it is necessary to approach the aforementioned problems in a novel way by making use of extensive spatio temporal multimodal historical data as well as cutting-edge deep learning algorithms. A new hybrid model for forecasting cyclone tracks is put out and assessed. This hybrid model consists of a pressure field branch that uses along short term memory neural network to extract spatio temporal features from reanalysis of the data and a cyclone features branch that uses convolution neural networks to extract temporal features from 2-D state vectors from the cyclone images. The above mentioned model is designed to predict cyclone intensity and track using these two neural networks. This allows for the full exploitation of the implicit correlations of multimodal data, yielding advantages not available to unimodal data-based methods.*

Keywords: Deep Learning, CNN, K-Nearest Neighbors, Long Short Term Memory and Decision tree