

## **A Hybrid Deep Learning CNN-LSTM Model for Predicting Monthly Rainfall Over Japan**

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Predicting rainfall is an important task due to the high reliance on it, especially in the agriculture sector. Prediction is difficult and even more complex due to the dynamic nature of rainfall. In this study, we carry out monthly rainfall prediction over some selected locations in Japan. The rainfall data were obtained from the Japan Meteorology Agency (JMA). We study the predictive capability of a hybrid Convolution Neural Network (CNN) integrated with Long Short Term Memory (LSTM) model on the parameters recorded by the automatic weather station in the selected regions. The developed hybrid model is applied to four different locations in different climatic regimes in terms of monthly precipitation characteristics. Overall, this study was able to establish the skill performance of hybrid CNN-LSTM model in capturing complex relationship between the causal variables and monthly variation of rainfall in the study region.