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Forecasting of Rainfall in Subdivisions of India Using Machine Learning

| Conference paper | First Online: 16 May 2024

| pp 205–214 | Cite this conference paper

Recent Trends in Intelligence Enabled Research

(DoSIER 2023)

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📚 **Part of the book series:** Advances in Intelligent Systems and Computing ((AISC, volume 1457))

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Abstract

The most important stochastic phenomenon, rainfall is crucial to the Indian agriculture industry and is required for the nation's economic development. Rainfall forecasting has grown increasingly difficult in recent years as a result of the climate changes brought on

by global warming's worsening consequences. The major goal of this work is to apply machine learning approaches to identify the pertinent atmospheric variables that generate rainfall and predict the severity of daily rainfall. Using data from 1901 to 2015 across India at the meteorological divisional level, this study assesses and projects long-term spatiotemporal variations in rainfall. In order to predict the impending annual rainfall across India, machine learning models, like Ridge, Lasso, artificial neural network (ANN), SVM, and long short-term memory (LSTM) were used. The performance of the machine learning model was evaluated using the root mean squared error, mean squared error, and mean absolute error approaches. The study's findings showed that the long short-term memory machine learning algorithm outperformed others.

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Cite this paper

Hazra, S., Ghosal, S., Mondal, A., Dey, P. (2024). Forecasting of Rainfall in Subdivisions of India Using Machine Learning. In: Bhattacharyya, S., Das, G., De, S., Mrsic, L. (eds) Recent Trends in Intelligence Enabled Research. DoSIER 2023. Advances in Intelligent Systems and Computing, vol 1457. Springer, Singapore. https://doi.org/10.1007/978-981-97-2321-8_18

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