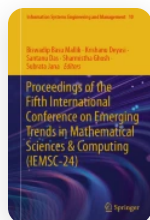


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Modeling Rainfall Prediction Framework Using Machine Learning Approach: A Comparative Study

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Abstract

Forecasting rainfall is a critical issue for meteorological departments since it has a big impact on both the economy and human lives. Different measures to deal with natural disasters like floods and drought can be planned depending on the accuracy of rainfall forecasting. It is even more important for a country like India where economic status is immensely agriculture dependent. Because the atmosphere is essentially dynamic, most statistical approaches are unable to predict rainfall with any degree of reasonable precision. Therefore, we rely upon machine learning-based prediction techniques of forecasting using historical data and past patterns.

In this work, a variety of regression models, such as Support Vector Regression(SVR), decision trees, linear regression and Random Forests have been studied to find the most efficient model for both temporal and spatial forecasting. Evaluation criteria focus on the R-squared method, for assessing the goodness of fit. The paper underscores the practical implications, emphasizing key areas where accurate weather prediction is vital. It suggests applications in disaster preparedness, agriculture planning, and resource management, thereby emphasizing the potential societal impact of employing linear regression for enhanced weather forecasting.

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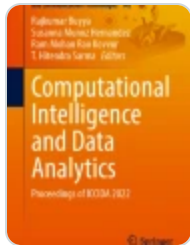
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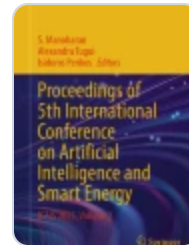
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References

1. Kunjumon, C., Nair, S.S., Suresh, P., Preetha, S.L.: Survey on weather forecasting using data mining. In: Conference on Emerging Devices and Smart Systems (ICEDSS), pp. 262–264. IEEE (2018)

[Google Scholar](#)

2. Saima, H., Jaafar, J., Belhaouari, S., Jillani, T.A.: Intelligent methods for weather forecasting: a review. In: 2011 National Postgraduate Conference, pp. 1–6. IEEE (2011)

[Google Scholar](#)

3. Khajure, S., Mohod, S.W.: Future weather forecasting using soft computing techniques. *Procedia Comput. Sci.* **78**(C), 402–407 (2016)

[Google Scholar](#)

4. Kumar, D., Singh, A., Samui, P., Jha, R.K.: Forecasting monthly precipitation using sequential modelling. *Hydrol. Sci. J.*, 64(6), 690–700 (2019)

[Google Scholar](#)

5. Dubey, A.D.: Artificial neural network models for rainfall prediction in Pondicherry. *Int. J. Comput. Appl.* (2015)

[Google Scholar](#)

6. Gheisari, M., Wang, G., Bhuiyan, M.Z.A.: A survey on deep learning in big data. In: 2017 IEEE International Conference on Computational Science and Engineering (CSE) and IEEE International Conference on Embedded and Ubiquitous Computing (EUC), vol. 2, pp. 173–180. IEEE (2017)

[Google Scholar](#)

7. Arnav, G., Kanchipuram Tamil Nadu: Rainfall prediction using machine learning. *Int. J. Innov. Sci. Res. Technol.*, 56–58 (2019)

[Google Scholar](#)

8. Nayak, D.R., Mahapatra, A., Mishra, P.: A survey on rainfall prediction using artificial neural network. *Int. J. Comput. Appl.* (2013)

[Google Scholar](#)

9. Abhishek, K., Singh, M.P., Ghosh, S., Anand, A.: Weather forecasting model using artificial neural network. *Procedia Technol.* **4**, 311–318 (2012)

[Article](#) [Google Scholar](#)

10. Dutta, P.S., Tahbilder, H.: Prediction of rainfall using data mining technique over Assam. *Indian J. Comput. Sci. Eng. (IJCSE)* **5**(2) (2014)

[Google Scholar](#)

11. Chao, Z., Pu, F., Yin, Y., Han, B., Chen, X.: Research on real-time local rainfall prediction based on MEMS sensors. *J. Sen.* (2018)

[Google Scholar](#)

12. Lu, K., Wang, L.: A novel nonlinear combination model based on support vector machine for rainfall prediction. In: *Proceedings of the 2011 Fourth International Joint Conference on Computational Sciences and Optimization*, Kunming, China, 15–19 April 2011 (2011)

[Google Scholar](#)

13. Tharun, V.P., Prakash, R., Devi, S.R.: Prediction of rainfall using data mining techniques. In: *2018 Second International Conference on Inventive Communication and Computational Technologies (ICICCT)*. IEEE Xplore (2018)

[Google Scholar](#)

14. Dash, Y., Mishra, S.K., Panigrahi, B.K.: Rain-fall prediction for the Kerala state of India using artificial intelligence approaches. *Comput. Electr. Eng.* **70**, 66–73 (2018)

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15. Barrera-Animas, A.Y., Oyedele, L.O., Bilal, M., Akinosho, T.D., Delgado, J.M.D., Akanbi, L.A.: Rainfall prediction: a comparative analysis of modern machine learning algorithms for time-series forecasting. *Mach. Learn. Appl.* **7** (2022)

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