

Rainfall Forecasting and Density Estimation Using Machine Learning

Esther Gandhimathi, Ruthesh Prem Kanth CH, Boyella Sumanth, Shaik Sohail, Syed Masthan
Dhanalakshmi College of Engineering, Chennai, India

Abstract: India is agrarian and its economy is primarily based on crop productivity and rainfall. Rainfall forecasting is very important for all farmers to analyse crop productivity. Utilising science and technology to forecast atmospheric conditions is known as precipitation forecasting. For effective use of water resources, crop productivity, and long-term planning of water resources, accurate rainfall estimation is essential. It can predict rainfall using a variety of machine learning techniques. equipment that is used to estimate rainfall. The prominent machine learning techniques for predicting rain are the main topic of this essay. In this article, several methods are examined, including the random forest algorithm, simple linear regression, and polynomial regression. This comparison allows us to determine which algorithm forecasts rainfall with more accuracy.

Keywords: Forecasting.

REFERENCES

- [1]. Xiong, Lihua, and Kieran M. OConnor. "An empirical method to improve the prediction limits of the GLUE methodology in rainfall runoff modeling." *Journal of Hydrology* 349.1-2 (2008): 115-124.
- [2]. Schmitz, G. H., and J. Cullmann. "PAI-OFF: A new proposal for online flood forecasting in flash flood prone catchments." *Journal of hydrology* 360.1-4 (2008): 1-14.
- [3]. Riordan, Denis, and Bjarne K. Hansen. "A fuzzy casebased system for weather prediction." *Engineering Intelligent Systems for Electrical Engineering and Communications* 10.3 (2002): 139-146.
- [4]. Guhathakurta, P. "Long-range monsoon rainfall prediction of 2005 for the districts and sub-division Kerala with artificial neural network." *Current Science* 90.6 (2006): 773-779.
- [5]. Pilgrim, D. H., T. G. Chapman, and D. G. Doran. "Problems of rainfall-runoff modelling in arid and semiarid regions." *Hydrological Sciences Journal* 33.4 (1988): 379-400.
- [6]. Lee, Sunyoung, Sungzoon Cho, and Patrick M. Wong. "Rainfall prediction using artificial neural networks." *journal of geographic information and Decision Analysis* 2.2 (1998): 233-242..
- [7]. French, Mark N., Witold F. Krajewski, and Robert R. Cuykendall. "Rainfall forecasting in space and time using a neural network." *Journal of hydrology* 137.1-4 (1992): 1-31.
- [8]. Charaniya, Nizar Ali, and Sanjay V. Dudul. "Committee of artificial neural networks for monthly rainfall prediction using wavelet transform." *Business, Engineering and Industrial Applications (ICBEIA), 2011 International Conference on. IEEE, 2011.*
- [9]. Noone, David, and Harvey Stern. "Verification of rainfall forecasts from the Australian Bureau of Meteorology's Global Assimilation and Prognosis(GASP) system." *Australian Meteorological Magazine* 44.4 (1995): 275-286.
- [10]. Hornik, Kurt, Maxwell Stinchcombe, and Halbert White. "Multilayer feedforward networks are universal approximators." *Neural networks* 2.5 (1989): 359-366.
- [11]. Haykin, Simon. *Neural networks: a comprehensive foundation*. Prentice Hall PTR, 1994.
- [12]. Rajeevan, M., Pulak Guhathakurta, and V. Thapliyal. "New models for long range forecasts of summer monsoon rainfall over North West and Peninsular India." *Meteorology and Atmospheric Physics* 73.3-4 (2000): 211-225.