

Rainfall Prediction Using Regression Analysis Techniques

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Abstract

In Science and technology Weather forecasting is the important application is used to the weather condition based on the given input parameters and attributes. Many systems are already implemented for the weather prediction using statistical methods. These systems are failed to give the accurate prediction. Using the multi linear regression concept proposed technique can produce better results than the existed systems.

Keywords: Multi Linear Regression, Analysis Technique, Rainfall

1. Introduction

In metrology weather prediction is a very complex thing. Previously for the weather prediction relied on the nature events like sunset color and nature odor. Rainfall prediction will help in many fields like Transportation, aircraft, disaster management, defense etc.,

Predict the future is the key issues used in many fields. Time series analysis is one of the common statistical methods used to predict and which are used widely in many applications of statistical and economic terms in which the behavior of the dependent variable prediction based on its behavior in the past. On the other hand, there is a modern method more accurate and effective in forecasting which can use logic in their operations rather than the idea of the fixed relationship between attributes known as Neural Networks.

2. Literature Review

In paper 1 authors used k-means clustering algorithm to present the model. For weather predictions implemented density function algorithm for the generation of numerical results. Authors developed a special construction model for knowing the probability by the k-means clustering technique. Authors obtained a very good results and accuracy will be shown in the table 1 [1].

In paper 2 authors used SLIQ and proposed a decision tree method for the precipitation model. They find out that the decision tree method archives a very near argument between actual and predicted rainfall. A greater accuracy rate is given by the SLIQ method when compared to the other weather prediction methods [2].

In paper 3 authors are proposed annual average rainfall prediction model on the basis of the BP network combined with discriminant step wise method and Bayesian statistical method used to improve the network's generalization ability and prediction model accuracy, but entire performance has to be developed [3].

In paper 4 authors proposed a time series of analysis which are used as a prediction algorithm. In these authors research on the both rainfall and crop management. For agriculture management decision support system is used by prediction algorithm a system is aimed to develop trend of the rainfall and the result of the accuracy is shown in the table 1 [4].

In paper 5 authors proposed an autoregressive integrated moving average for the rain data forecasting. In this results are more accurate in the individual method other than the ensemble methods [5].

In paper 6 authors proposed an incremental k-means clustering technique for the weather forecasting. In this paper authors taken the air pollution data for the weather prediction based on the atmospheric gas percentage getting the weather prediction values [6].

In paper 7 authors proposed picture fuzzy clustering and spatiotemporal methodology for the weather casting from satellite images by sequencing them. In this paper mainly clusters are used for the pixels which are acquired by the satellite images for this fuzzy clustering is used. For filtering of non predictable values used fourier transform method [7].

In paper 8 authors proposed a genetic algorithm concept on the evolution of the natural genetic mechanisms working on giving the solutions to population contrast. In this paper authors observed the

smoothness of the function which is optimized get a very good performance [8].

In paper 9 authors presented a supervised technique using the KNN for the weather prediction. In this paper authors taken the four years data with the parameters of the weather attributes like fog, rain, wind, snow. Clustering is used to identify the large clusters in the spatial data [9].

In paper 10 authors proposed the weather analyzers with the help of the SVM data mining technique. With the help of machine learning algorithm developed an SVM hybrid model. Working of this model is very effective and able to recognize the patterns from the given weather data. For the regression and classification methods SVM K-means clustering is used [10].

In paper 11 authors proposed the technique for estimation of the sunshine by the data mining approaches. In this paper authors have taken the four city data sets. Data sets are collected from the Indian metrological department. This data set contains the maximum and minimum temperature of the weather in that particular city [11].

In paper 12 authors proposed an outlier analysis for the prediction of the humidity and temperature in the atmosphere with the help of the metrological data from the metrological department. The main function of the outliers analysis is used to detect the outliers in the data and partitioning of the data is possible with the cluster analysis [12].

In paper 13 authors proposed the k-means clustering model and make an effort and shown the atmospheric pressures within the temperature. Atmospheric pressures values are noted for this atmospheric pressures Bangladesh set is taken [13].

In paper 14 authors proposed a time series analysis for the identification of the temperature and missing values in the datasets are filled by the linear interpolation and outliers are removed by the outlier analysis [14].

In paper 15 authors presented a simulation methodology for the weather prediction by using the wave propagator with high resolution of the NWP data. For the many common problems in the standard data are cleared by the clusters.

Table 1: Tabular comparison between the authors and algorithms

Author	Algorithms	Technique	Accuracy in %
E.G.Petre	CART	Decision tree	83
F Oliya	CART,TLFN	Decision tree, ANN	82
Z jan et al	KNN	Lazy learning	96
M kannan	MLR	Regression	62
S badhiye	KNN, Clustering	Lazy learning	100
S yeonetal	C4, CART	Decision tree	93
P Sallis	CRT, SOM, CHAID	Decision tree, ANN	85

In the above table recorded the accuracies of the authors contributed their works for the weather prediction mechanisms by using different algorithms with the efficient techniques.

As the table shows KNN has achieved the more accuracy when compared to the other techniques on the

other hand artificial neural network also shows the enormous results. Algorithms are also most important part of for the good accuracy of the model. Clustering algorithms are the most important one when we are dealing with the spatial and bigger data sets.

Comparison graph

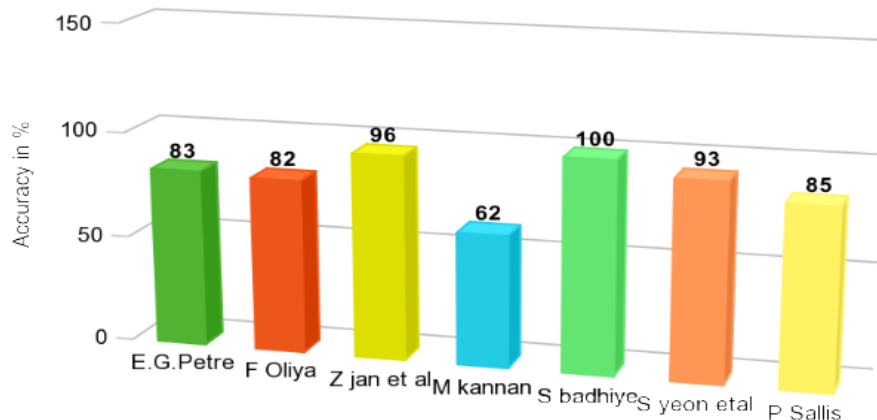


Figure 1: Comparison between the authors in accuracy

Comparison graph

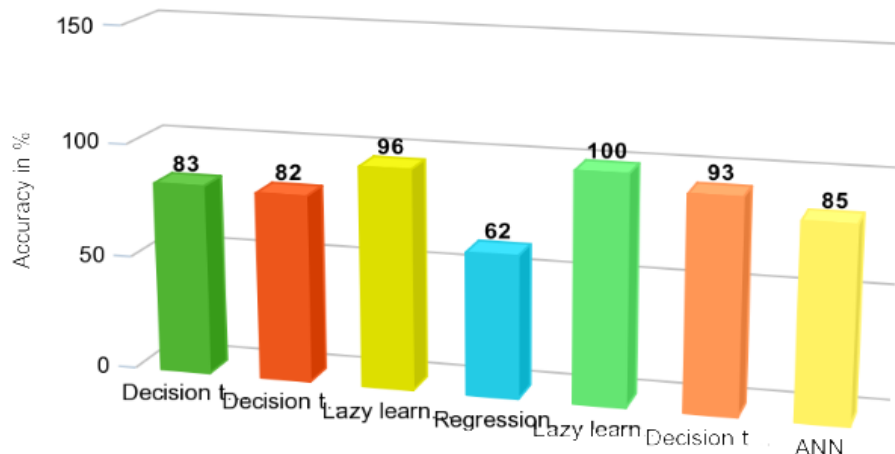


Figure 2: Comparison between the techniques

gives better results for rainfall prediction compared to the existing techniques.

3. Conclusion

Many existed systems used statistical methods, whereas the proposed method is done using the regression methodologies to produce the accurate results. The use of neural networking back propagations will optimize the results by applying back propagation technique. Historical data's are used for the proposed method has day, month and year are used to predict the weather. From the findings, it is clear that the proposed method

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