

Rainfall Prediction Using Machine Learning

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ABSTRACT

Rainfall prediction is challenging tasks in advanced world. Rainfall and climate is high non linearly and complex process, for their exact prediction it required modern computer simulation and modeling. It providing a research and survey of some methodologies on available literature to utilize various regression technique for prediction employed by many researchers. This model states which 'rainfall prediction' algorithm is suitable than outdated methods.

Keywords

Machine Learning, Neural Networks, Data visualization

1. INTRODUCTION

The weather condition around the world changes rapidly and continuously. Correct forecasts are essential in today's daily life. From agriculture to industry, from traveling to daily commuting, we are dependent on weather forecasts heavily. As the entire world is suffering from the continuous climate change and its side effects, it is very important to predict the weather without any error to ensure easy and seamless mobility, as well as safe day to day operations. The project predicts the weather of future dates based on the previous data using concepts of machine learning.

We take 'Regression model' data of Delhi's climate from 1997 to 2017 as the feed and predicts the temperature of particular date. The linear regression model is used in many project. We are using linear regression, Random Forest and Decision Tree to predict the output, in order to get the results and compare the models for its accuracy. Physically simulating the atmosphere as a fluid, weather forecast is always perform. We are sampling current atmosphere state. For solving the numerical equations of thermo and fluid dynamics, the future state of the air is computed. In different kinds of weather, in human life rainfall play the important part. Rainfall have vital role in human civilization. As rainfall is nature's call, it is very hard to know its situation, that is why it have much demand. It is very important to predict rainfall because it is directly linked to the conservation of water resources, operations of the reservoir and in detection of flood level in nearby body. Water level due to rainfall affects the human activities such as sewer and traffic.

Due to the atmospheric process rainfall creates complications in understanding of model in water cycle and has variation in atmosphere and lithosphere with time. This paper contains prediction of rainfall in wide terminology that will last. This research paper will provide the information about rainfall that will help in its prediction of particular area. The former data will be helping us in this in prediction of rainfall. There is already a technique given by Holmstrom that forecast minimum and maximum temperature of next week with the help of information of past two days. With the help of a functional linear regression model and a linear regression model, they proved that both of the above models were not good as professional weather forecasting services for the prediction up to a week. However, in later days or longer time scales their model performs better in forecasting. It was studied a hybrid manner, which combined many trained prediction model with the deep neural networks.

2. OBJECTIVE AND SCOPE

Rainfall Prediction Model has a main objective in prediction of the amount of rain in a specific well or division in advance by using various regression technique and find out which one is best for rainfall prediction. This model also helps the farmer for agriculture to decide the crop, helping the watershed department for water storage and also helps to analyze the ground water level.

3. METHODOLOGY

For conducting the experiments in correct format data is altered.

- Observe variation in rain pattern and have good analysis.
- For prediction of average rainfall separated data into testing and training. We apply ML tactics in pursuit of make analyzing over various methods. So it reduces the error

4. RESULTS & DISCUSSION

Table 1: Training on complete dataset

Algorithm	MAE
Linear Regression	57.08862331011229
SVR	116.60671510825178
Artificial neural nets	42.132246471373314

- Neural Networks have good outcome than SVR etc.
- SVR gives Low performance.
- It gives sufficient means and SD.

5. CONCLUSION

The ways for predicting rainfall is due to many data visualization.

- For either types of data for its prediction.
- Dataset1-This data is having mean rainfall from 1951-2000 for each district, for every month.
- Dataset2- From 1901-2015 onwards it have average rainfall for every state.

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