

Team Id: PNT2022TMID38676.

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Team Title: Exploratory Analysis of Rain Fall Data In India For Agriculture. **Members List:** ARAVIND.A, LOGESHWARN.V, VIGNESH.M

INTRODUCTION		SURVEY/BODY OF REVIEW					CONCLUSION		
Year	Title	Keywords	Problem Definition	Methodology (Algorithm, Protocol Etc.)	Input Parameters	Result	Advantages	Disadvantages/ Drawbacks	Research Gap/Research Question
Vikram 1. 2022	Rain Prediction Based On Machine Learning	Machine Learning, Rain Prediction, LSTM.	To predict the weather of the next day, since whether it will rain tomorrow is a very important indicator.	Logical Regression, Linear Regression, Classifier, KNM, Boost algorithm, Bagging algorithm.	The Z-score standard is based on the mean and square value of the original data.	The current model achieve an accuracy of 82% which is not outstanding enough as our expectations.	It can process nominal and numerical data at the same time.	Prone to over fitting. It is difficult to deal with missing data.	It may handling over fitting, Deal with missing data?
2. 2022	Statistical Verification of 16-day Rainfall forecast for a farmers advisory service in Pakistan.	Advisory Decisions Farmers Forecast Weather	Statistical verification of 16-day rainfall forecast for a farmers advisory service.	Deterministic Real-value Forecast.	The weather forecast data archived by open weather Map	Statistically, a weekly forecast can be developed with a week	How much rainfall is sufficient for farmers to skip an irrigation depends on type of crop.	The statistical indicator 'accuracy' remained around 85%.	How to increase Statistical indicator 'accuracy'?
3. 2022	Development of rainfall forecasting model using Ml with SSA	Rainfall, Singular Spectrum Analysis, ML.	The problem is to investigate and process the climate.	Linking SSA with LS-SVR and RF.	110 years of climate data.	Monthly prediction of whether	The proposed model accuracy is assessed by RMSE and NSE	Only one data pre-processing strategy has not been accepted; Is doesn't show exact results.	How to make exact prescient results?
4. 2021	Rainfall forecasting model using Machine Learning.	Forecasting rainfall, ML, Decision forecast regression.	Whether there is an extreme changes in the occurrence and frequency of heavy rainfall.	Decision forest regression, Neural network regression, Boosted decision tree regression.	10 stations rainfall data.	The table shows best model result to predict rainfall based on ACF.	Precaution is decided, gives alert it will be rain today	The prediction consist of 93% accuracy.	How increase the prediction accuracy?

Logeshwaran 5. 2022	Rainfall prediction system using machine learning fusion for smart cities	Rainfall, Machine learning, data fusion, fuzzy system.	Real-time rainfall prediction system for smart cities using machine leaning.	Classification and regression, ANN- based hybrid technique, Decision tree.	The simulation data files. A real time rainfall dataset of the city	The output will be indicate whether there will rain or not.	The use of machine learning the prediction accuracy may increases.	It will not ensure cost-Effective prediction.	What is the implementation of fuzzy system in machine learning?
6. 2021	Rainfall prediction using machine learning algorithms for the various Ecological zones of Ghana.	Rainfall prediction, classification algorithms, ecological zones.	To using various classification algorithms for rainfall prediction in different zones .	Classifications framework, Data Exploratory and analysis, Decision tree.	Rainfall, relative humidity, Sunshine hours and wind speed data from the 22 synoptic stations.	The performance of the models on the 3 different ratios covering all zones.	Input dataset went through the exploratory data analysis.	It doesn't use other classification algorithms and a hybrid model at different training and different testing ratios for rainfall prediction.	How to import a hybrid model at different training and different testing ratios for rainfall prediction?
7. 2021	Machine learning based algorithms for uncertainty quantification in numerical weather prediction models.	Numerical weather prediction model, precipitation prediction.	Use of machine learning uncertainty in numerical weather prediction model due to the interaction of multiple physical process.	Machine Learning algorithms, Random forests, Numerical experiments, The WRF model.	Different parameters of rainfall.	Numerical experiment done with WRF model.	It is better to use data form both previous window and previous day mitigate diurnal effects.	Advanced machine learning algorithms can't used in this model.	What are the uses of advanced machine learning technologies?
8. 2020	Rainfall prediction Using Machine Learning & Deep learning Techniques.	Rainfall, Prediction, Artificial Neural Network, Deep learning.	Time series prediction and analysis and forecasting.	Auto Regressive Integrated Moving Average, Artificial Neural network, Support Vector Machine.	By using the sensor taking the input like wind, light, etc..	The training testing and validation set results are combined to get the best result at the targeted value as shown in graphical representation	Inputs are taken by the sensors. New techniques may implemented.	Architecture of the light and weather scenarios has not been improved.	What are the improvement needed for architecture of light and weather scenarios?

Aravind. 9. 2022	Machine Learning in Weather Prediction and Climate Analyses Applications and Perspectives.	Machine learning; weather; numerical weather prediction; climate.	Machine learning methods will be a key feature in future weather forecasting.	Deep Learning, Random Forest, XGBoost, K-means Clustering, Principal Component Analysis.	wind, precipitation , temperature, pressure, and radiation	Use machine learning and artificial intelligence methods in meteorology and climatology.	Machine learning may have a particularly significant application in synoptic meteorology and climatology.	Correctly implement any machine learning method and not to use it as a black box.	What are the new features available in AI technology?
10. 2022	Rainfall prediction: A comparative analysis of modern machine learning algorithms for time-series forecasting.	Rainfall prediction LSTM, Networks Multivariate time-series, Multi-step forecast, Time-series data.	Rainfall forecasting techniques in preparation for any eventuality.	Automated machine learning, XGBoost model, LSTM and Stacked-LSTM models.	Climate data from 2000 to 2020 from five major cities.	The results of the prediction models tested with the best values obtained by the hyper parameter search.	Rainfall forecasting models based on LSTM-Networks architectures with modern Machine Learning algorithms.	It doesn't consider other weather factors.	How it's predicts the weather factors?
11. 2020	Linking Singular Spectrum Analysis and Machine Learning for Monthly Rainfall Forecasting.	Rainfall forecasting; machine learning; least square support vector regression; random forests; singular spectrum analysis.	Development of monthly rainfall forecasting models.	Coupling SSA with Machine Learning, Singular Spectrum Analysis, Random Forest, Least-Squares Support Vector Machine.	Historical Monthly rainfall dataset.	Moreover, the performances of the hybrid models vary in both reservoir watersheds.	One of the major findings is that the hybrid models have better performance than the standard models for both watersheds.	As observed from Table, it is found that RMSE and NSE exhibit very poor values for the standard models using.	When to use various preprocessing techniques?
12. 2020	Regional Rainfall prediction using support vector machine classification of Large-scale Precipitation.	Rainfall, Singular Spectrum Analysis, ML.	Large-scale precipitation maps can under some conditions give useful information for predicting regional rainfall.	Classification, Comparison between different SVM inputs, Pre-Processing.	Regional rainfall data parameters.	Comparison between different SVM inputs, Comparison between regional predictions.	Weather prediction up to 30 days in advance.	In the current model we did not attempt to include additional engineered features.	What are the additional engineered features?

Vignesh 13. 2021	Weather based crop prediction in India using Big data Analytics.	Agriculture, big data analysis, k-means clustering, map reduce, recommendation system.	Prediction of crops in India using big data analytics.	By using map reduce, time delay recurrent, neural network and feed forward neural network.	Temperature , rainfall, wind speed, humidity, soil type, seed type.	Sowing of crops according to your input month.	It uses big data analytics , k-mean clustering.	It has high complexity and takes more time.	What are the tools used for big data analytics?
14. 2020	Machine learning based Rainfall prediction.	Multiple linear regression, rainfall, prediction, machine learning, accuracy.	Prediction of weather using multiple linear regression.	Multiple linear regression approach.	Rainfall data from weather station.	MLR based rainfall prediction.	It uses multiple linear regression instead of simple linear regression	Input data must only be obtained from locally available sources.	What are the assumption made by multiple linear regression?
15. 2020	Designing a model for weather forecasting using machine learning.	Meteorological, prediction, weather.	Prediction of weather numerically.	Numerical model approach.	Maximum and minimum temperature, dampness, normal temperature.	Prediction of weather using mathematical model.	Visual representation of weather.	Calculate weather only in a particular region.	What are the different modules included?
16. 2019	Weather Forecasting Using machine learning Algorithm.	Weather forecast, machine learning, Raspberry, python, confusion matrix, sensor.	Process of predicting weather condition for future.	Machine learning Approach.	Humidity, temperature, pressure.	Prediction of rainfall.	More accuracy.	Sudden climate change may occur at anytime.	Probability of getting rainfall?