**Literature Survey**

***Professional Readiness for Innovation, Employability and Entrepreneurship [Nalaiya Thiran]***

**Project Title** - *Exploratory Analysis of RainFall Data in India for Agriculture*

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| **Journal,**  **Research**  **Paper,**  **Publication & Article Title** | **Citation** | **Description** |
| 1. Machine  Learning based  Rainfall Prediction | Grace, R. Kingsy; Suganya, B. (2020). *[IEEE 2020 6th*  *International Conference on*  *Advanced Computing and*  *Communication Systems*  *(ICACCS) - Coimbatore, India (2020.3.6-2020.3.7)] 2020 6th*  *International Conference on*  *Advanced Computing and*  *Communication Systems (ICACCS) - Machine Learning*  *based Rainfall Prediction., (),*  *227–*  *229.* doi:10.1109/ICACCS487  05.2020.9074233 | This paper explains the proposed method MLR [Multiple Linear  Regression] based Rain Fall Prediction. The proposed method predicts the rainfall for the Indian dataset using multiple linear regression and provides improved results in terms of accuracy, MSE and correlation. The data for the prediction is collected from the publicly available sources and the 70 percentage of the data is for training and the 30 percentage of the data is for testing. |
| 2. Machine  Learning  Techniques For  Rainfall Prediction:  A Review | 2017 International  Conference on Innovations in information Embedded and  Communication Systems  (ICIIECS)  - Aakash Parmar, Kinjal  Mistree, Mithila Sompura -  Department of Computer  Engineering, CGPIT, Uka  Tarsadia University, Bardoli,  Surat, India | Review work and comparison of different approaches and algorithms used by researchers for rainfall prediction is shown in a tabular form. Intention of this paper is to give nonexperts easy access to the techniques and approaches used in the field of rainfall prediction. |
| 3. Hybrid Prediction  Models for Rainfall  Forecasting | Singh, Gurpreet; Kumar,  Deepak (2019). *[IEEE 2019 9th International Conference on Cloud Computing, Data Science & Engineering*  *(Confluence) - Noida, India*  *(2019.1.10-2019.1.11)] 2019 9th International Conference on Cloud Computing, Data*  *Science & Engineering*  *(Confluence) - Hybrid*  *Prediction Models for Rainfall*  *Forecasting. , (), 392–*  *396.* doi:10.1109/CONFLUEN  CE.2019.8776885 | In this study, several hybrid forecasting models are proposed that are combinations two feature selection techniques, Gradient boosting and Random forest with various machine learning techniques, viz Support Vector Machine (SVM), adaboost, Neural Network (NN) and K-Nearest Neighbour (KNN). These model have been applied to the past 11 years (2007 2017) weather data to predict rainfall in town of carry, North caroliana. The performances of these algorithms have been computed on different metrics F-score, precision,  recall, accuracy. Empirical findings have shown that the proposed model i.e GB-Adaboost is superior when compared with others without feature selection. |
| 4. A Data-Driven Approach for  Accurate Rainfall  Prediction | Manandhar, Shilpa; Dev,  Soumyabrata; Lee, Yee Hui;  Meng, Yu Song; Winkler,  Stefan (2019). *IEEE Transactions on Geoscience and Remote Sensing, (), 1– 9.* doi:10.1109/TGRS.2019.29  26110 | In the paper, different ground-based weather features that are important for the prediction of rain events have been identified and a detailed analysis is done to study the interdependence of these variables. Seasonal and diurnal factors into the model, along with weather variables have been incorporated. |
| 5. Clock hour correction effect on extreme value analysis of rainfall on Western Coast of India | Dauji, Saha (2019).*ISH Journal of Hydraulic Engineering, (), 1–13.*  doi:10.1080/09715010.20  19.1687338 | Continuous hourly rainfall data from a monsoon rainfall site on the western coast of India was taken and the effect of time discretization of rainfall recordson the EVA was studied. The objective was to evaluate CHCF from limited continuous hourly data from the site.The effect of the process of data selection (FW or SW) as well as the data length (17 or 68), on EVA was also examined. |

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| 6. Heuristic | Thirumalai,Chandrasegar; Ha | The paper measures various |
| Prediction of | rsha, K Sri; Deepak, M | categories of data by linear regression |
| Rainfall Using | Lakshmi; Krishna, K | method in metrics for effective |
| Machine Learning | Chaitanya (2017). *[IEEE 2017* | understanding of agriculture in India. A |
| Techniques | *International Conference on* | real dataset has been, which consists |
|  | *Trends in Electronics and* | of past year’s rainfall rate according to |
|  | *Informatics (ICOEI) -* | various seasons. Results of this |
|  | *Tirunelveli, India (2017.5.11-* | application help farmers to make |
|  | *2017.5.12)] 2017* | correct decisions to harvest a |
|  | *International Conference on* | particular crop accordingly to crops |
|  | *Trends in Electronics and*  *Informatics (ICEI), 11141117.* doi:10.1109/ICOEI.201  7.830884 | seasons. |
| 7. Analyzing trend | Praveen, Bushra; Talukdar, | Based on the change point year, the |
| and forecasting of | Swapan; Shahfahad, ; | rainfall variability and trend analysis |
| rainfall changes in | Mahato, Susanta; Mondal, | were carried out for pre and post |
| India using | Jayanta; Sharma, Pritee; | change point phase. The rainfall |
| nonparametrical | Islam, Abu Reza Md. | variability was increased significantly |
| and machine | Towfiqul; Rahman, Atiqur | in most of the meteorological sub- |
| learning | (2020). *Scientific Reports,* | divisions after post change point and |
| approaches | *10(1), 10342–* | similar kinds of results were found |
|  | *.* doi:10.1038/s41598-020- | when the rainfall trend was analyzed |
|  | 67228-7 | for post change point. To get better results of trend analysis, the innovative trend analysis was employed. The results show that most of the subdivisions were recorded significant negative trend. |
| 8. Study of short | Balamurugan, M. S.; | In this study, using machine learning it |
| term rain | Manojkumar, R. | has been observed that forecast was |
| forecasting using | (2019). *Study of short term* | able to achieve much better rainfall |
| machine learning | *rain forecasting using* | prediction comparative to statistical |
| based approach | *machine learning based* | methods. The model was deployed in |
|  | *approach. Wireless Networks,* | a real time node set up using a Lora |
|  | *(), –.* doi:10.1007/s11276- | WAN and forecasting was done using |
|  | 019-02168-3 | Logistic Regression to find the probability of Rain. It also has minimal error as observed in RMSE calculation |

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