Review on 2Phase Neural Network Model For Weather Forecast Along-with Logistic and Linear Regression

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Abstract—Weather plays an important role in Human life. Many of our daily works and business depends upon weather conditions. Also there is a huge life and property loss due to unexpected Weather conditions. If we are able to efficiently predict the weather conditions for the future, then we can prevent or minimize these losses. The weather of the earth does not remain same at every time. We have many seasons like summer, winter, spring, autumn, Monsoon etc. Weather changes from time to time. This weather change is quite normal and regular phenomenon of earth. The world's atmosphere is likewise affected and changed through regular causes like volcanic emissions, sea ebb and flow, the world's orbital changes and sun powered varieties. Climate estimating is additionally valuable for different purposes like flight, transportation, fisheries and numerous other extraordinary uses other than gauges for the overall population. We have different types of forecasting, we can predict weather, stock market, next ruling political parties, natural disasters like tsunamis, earthquakes, floods and so on. By predicting the fore coming disaster we can take the required precautions and security measures Therefore, the weather forecast reports needs some intelligent computing which can read the nonlinear data and generate some rules and patterns to study and train from the observed data to predict the weather in future. Use of 2Phase NN will give results which are more accurate where as the data will be first regressed with Linear and Logistic regression over 2Phase NN. Here, the error may or may not reduce completely. But, the accuracy will improve as compared to previous forecasts. The weather forecasting is live forecasting where output of the model may be required for daily weather guide or weekly or monthly weather plans. Thus, the accuracy of the result is a very important aspect in this forecasting. Multiple issues are discussed which can be considered to get the accurate results and high degree of accuracy in weather forecasting.

Keywords—*Logistic Regression, Linear Regression, Artifical Neural Networks, 2Phase Neural Network, Maximum Likelyhood Estimation, Confusion Matrix.*

I. INTRODUCTION

Proposed work included a wide range of and fascinating systems to attempt to perform climate figures. While a lot of current determining innovation includes reenactments in light of material science and differential conditions, numerous new methodologies from computerized reasoning utilized essentially machine learning strategies, generally neural systems while some drew on probabilistic models, for example, Linear and Logistic Regression. Out of the proposed approach on machine learning for climate expectation and forecasting we inspected, two of them utilized neural systems while one utilized help back propagation."Neural systems appear to be the prominent machine learning model decision for climate determining on account of the neural systems to the capacity to catch the non-direct conditions of past climate patterns and future climate conditions, dissimilar to the straight relapse and practical relapse models that we utilized. This gives the upside of not accepting basic direct conditions of all highlights over our models. Of the two neural system approaches, one [3] utilized a mixture demonstrate that utilized neural systems to show the material science behind climate estimating while the other [4] connected adapting all the more specifically to anticipating climate conditions. Likewise, the approach utilizing bolster vector machines [6] additionally connected the classifier straightforwardly for climate forecast yet was more restricted in scope than the neural system approaches. Different methodologies for climate gauging included utilizing logistic and linear regression systems. One intriguing model [2] utilized Bayesian systems to model and make climate expectations however utilized a machine learning calculation to locate the most ideal 2Phase NN systems and parameters which was computationally costly due to the substantial measure of various conditions yet performed extremely well. Another approach [1] concentrated on a more particular instance of anticipating extreme climate for a particular topographical area which restricted the requirement for calibrating Bayesian system conditions however were constrained in scope."

Weather forecasting is a process of identifying and predicting to certain accuracy the climatic conditions using multiple technologies. Many of the live systems rely on weather conditions to make necessary adjustments in their systems. Forecasting helps to take necessary measures to prevent damage to life and property to a large extent. Quantitative forecast like temperature, humidity and rainfall are important in agriculture area, as well as to traders within commodity markets. Temperature conjectures are utilized by service organizations to gauge request over coming days. Since open air exercises are extremely confined by substantial rain, snow and the chill; estimates can be utilized to design exercises around these occasions, and to prepare and survive them [11].

II. LITERATURE SURVEY

1. Use of forecast models Data mining is the extraction of hidden predictive information from large databases. It is a powerful new technology with great potential to help companies focus on the most important information in their data warehouses. Data mining tools predict future trends and behaviors, allowing businesses to make proactive, knowledge-driven decisions. The automated, prospective analyses offered by data mining move beyond the analyses of past events provided by retrospective tools typical of decision support systems. The manual extraction of patterns from data has occurred for centuries. Early methods of identifying patterns in data include Bayes theorem (1700s) and regression analysis (1800s). The proliferation, ubiquity and increasing power of computer technology has increased data collection, storage and manipulations. As data sets have grown in size and complexity, direct hands-on data analysis has increasingly been augmented with indirect, automatic data processing. This has been aided by other discoveries in computer science, such as neural networks, clustering, genetic algorithms (1950s), decision trees (1960s) and support vector machines (1980s). Data mining is the process of applying these methods to data with the intention of uncovering hidden patterns. Walker [1] has done the basic work to predict Asian monsoon prognostication and it is extended in [2-4] to improve the initial model which can predict the rainfall of summer and changes in temperature, the necessary steps to be taken in order to minimize the losses and damages that are caused due to bad weather. This project doesn't need any sophisticated costly equipment like the barometers, radars, satellites; it just needs the previous data sets and a computing device for the prediction.

2. Brian Dolan display the outline rationality, methods and experience giving MAD examination to one of the world's biggest promoting systems at Fox Audience Network, utilizing the Green plum parallel database framework. We depict database plan approaches that help the light-footed working style of examiners in these settings.

3. R. P. Singh clarify why a cloud-based arrangement is required, depict our model usage, and investigate some case applications we have executed that show individual information proprietorship, control, and examination. He address these issues by outlining and executing a cloud-based engineering that furnishes buyers with quick access and fine-grained control over their utilization information, and also the capacity To break down this information with calculations of their picking, including outsider applications that investigate that information in a protection saving style.

4. Jeffrey Dean depicts the essential programming model and gives a few cases. Numerous genuine errands are expressible in these models. Usage of Map Reduce keeps running on an extensive bunch of ware machines and is exceptionally adaptable: a regular Map Reduce calculation forms numerous terabytes of information on a huge number of machines. Software engineers and the framework simple to utilize: several Map Reduce programs have been actualized and upwards of one thousand Map Reduce employments are executed on Google's bunches each day.

III. PROPOSED WORK

The most outrageous temperature, slightest temperature, mean clamminess, mean barometrical weight, and atmosphere gathering for consistently in the years 2011-2017 for Delhi, India were gained from Weather department. Originally, there were nine atmosphere orders: clear, scattered fogs, to some degree shady, generally shady, dimness, overcast, rain, tempest, and snow. Since an extensive parcel of these requests are practically identical and some are meagerly populated, these were diminished to four atmosphere groupings by joining scattered fogs and not entirely shady into sensibly shady; generally shady, foggy, and shady into extraordinarily shady; and rain, tempest, and snow into precipitation. The data from the underlying four years were used to set up the counts, and the data from the latest year was used as a test set and the alluded data for January using the depicted parameters.

Input data is then pre-processed and cleaned. That means it is checked with any outlier and that is removed, missing values are entered, and data is checked if it is in the given range for the given parameter. Later ANN is designed with number of input and output nodes, hidden layers, activation function, and maximum number of epochs, weights, bias, goal and learning function. Neural network is trained with seventy percentages of the input data. Where the model is trained using this observed data to forecast the weather, followed by testing done using remaining thirty percentages of input data. Then the mean squared error and accuracy is calculated for the model by comparing the output of testing with target output. However, the confusion matrix will be produced from the Linear regression resulting the mean and variance and further the Logistic regression to produce the Slope and Maximum Likely Hood Estimation. The below diagram depicts the proposed framework which is implemented under the scheme to produce the results.
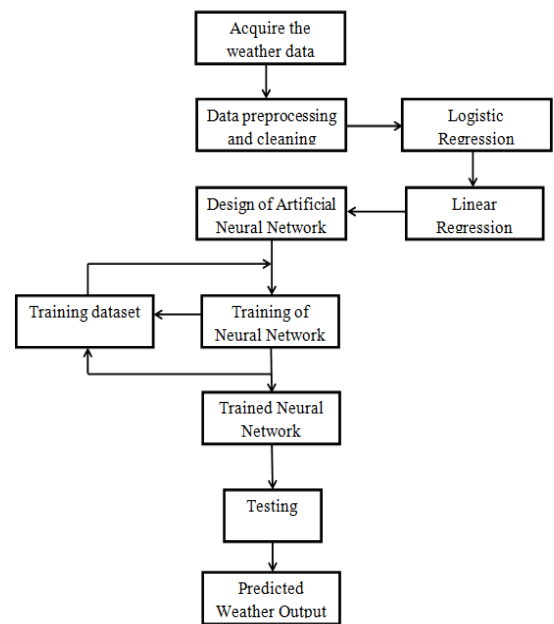

Figure1: Proposed Scheme

IV.   CONCLUSION

In the proposed scheme, we initially make a measure assessment of the attributes defined in 2 phase NN i.e Temperature, Dew, Humidity, Air Pressure, Wind Direction etc. and regression model will be inculcated to draw the estimate and discover ground truth field using confusion matrix vide linear regression modeling trust relationship and mitigating the relation again with logistic regression vide MLE (maximum likelihood estimation) forming the 2Phase NN classification for more accurate results and forecasting.

V.   REFERENCES

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