

Weather Forecasting Along with Climate Changing Using Data Mining Application

¹Sonali singh
Research scholar
Jyoti vidyapeeth women's university
Jaipur , rajasthan

²Arfiha khatoon
Research scholar
Jyoti vidyapeeth women's university
Jaipur , rajasthan

ABSTRACT : Weather forecasting is a major application in meteorology and has been one of the preponderance scientifically and technologically challenging issues around the world. In this paper, we scrutinize the use of data mining techniques in forecasting peak temperature, rainfall, evaporation & wind speed. Weather prophecy approaches are challenged by complicated weather phenomena with limited observations and past data. Weather phenomena have numerous parameters that are impossible to list and calculate. Access growth on communication systems enabled weather forecast expert systems to integrate along with share resources and thus hybrid system has appear. Even though these improvements on weather forecast, these expert systems can't be completely authentic since weather forecast is main problem. This paper is about Weather Forecasting along with climate changing using data mining application.

I. INTRODUCTION

Weather is one of the preponderance effectual environmental limitation in every phase of our lives. We are subject to modify ourselves with respect to weather condition from our dressing pattern to strategic organizational planning activities, since the unfavourable weather conditions may cause a significant damage on our lives and properties. We need to be on alert to these unfavourable weather conditions by taking few precautions and using prediction mechanisms for advance warning of hazardous weather phenomena. In this survey we try to give readers an overview regarding weather prediction phenomena, expert systems approaches, major domain specific issues, and solution methodologies.

Data mining : "Data mining is the process of discovering interesting patterns and knowledge from

large amounts of data". For example - Service providers.

The first example of Data Mining and Business Intelligence comes from service providers in the mobile phone and utilities industries. Mobile phone and utilities companies use Data Mining and Business Intelligence to predict 'churn', the terms they use for when a customer leaves their company to get their phone/gas/broadband from another provider. They collate billing information, customer services interactions, website visits and other metrics to give each customer a probability score, then target offers and incentives to customers whom they perceive to be at a higher risk of churning.

Weather forecasting : "Weather forecasting is the application which combines science and technology to predict the state of atmosphere for future time at a given location". Weather forecast is very important because it can be used to protect life and property.

A. WeatherPredictionIssueCharacteristic:

Weather prediction is a complex procedure that contains multiple specialized fields of expertise. There are at most 2 approaches to prophecy weather: the real approach and the dynamic approach.

B. Forecast kinds: Expert systems of weather forecast can be classified as terminal aerodrome forecasts (TAF's), Public forecasts and Marine forecasts in phrase of area of engrossment and scale. In inclusion to these, numerous functional forecasts are created for particular purposes (example weather impurity forecasting, agricultural prophecy) TAF's are necessary to be preponderance exact both in terms of quantifiable weather conditions and in terms of timing.

II. EQUIVALENT WORK

As it has been identified that weather conditions influence driver deportment and the way in which a transportation system needs to be work. By changing speeds, headways as well as other specification, drivers' response effect the overall system performance. This segment presents a full literature analysis on the classification of cold weather conditions and their conversion into quantifiable objective specification. The effect of such conditions on speed-flow density relationships is first explained. Such effect is related with a alter in capacity, delay, volume and speed, and reflects drivers' performance on a given road section. Once the alter in these parameters is satisfactory understood, the control aspect of the study is examine ; research studies linking weather results to signal timing,Unsignalized intersections and variable message signs are analysed.

- A. Weather Conditions : The effect of "weather conditions" over transportation systems is a common term that can create some confusion. Scientists have pre-owned, dissimilar classification schemes weather conditions, because these conditions separates more in type and in significance. few weather conditions are utmost in the natural world and hence can trigger a dissimilar response by the drivers. Such extreme conditions are outside the instant focus of the recent study. Different inclement weather conditions (like light and heavy rain, light and heavy snow many more.) give not so much compressed time form to the decision makers, and allow drivers to retain an acceptable amount of command on their vehicles; this command can be less than under "usual everyday" situation caused by physical factors such as visibility, physical discomfort (cold or hot temperatures) and lessen pavement friction with the tires when there is precipitation or icy situation prevail. Many existing studies do not describe all "weather conditions" in the form of measurable objective parameters, making it tough to explain or quantify the effect of such conditions on the transportation systems and their users.

Researcher	Ibrahim and Hall	Kyte etal.	Smith etal.
Location	Toronto, Ontario	Idaho	Hampton Roads, Virginia
Year	1994	2001	2004
Speed Reduction In Light Rain	1.9-12.9 km/hr (1.28mph)	9.5 km/hr (5.9mph)	3-5%
Speed Reduction in Heavy Rain	4.8-16.1 km/h (3-10mph)	9.5 km/hr (5.9mph)	3-5%

TABLE 1 : Rain Effects on Speed

		Freeway	Arterial
Researcher	Hanbali and Kuemmel	Knapp	Maki
Location	Illinois, Minnesota, New York, Wisconsin	Iowa	Minneapolis, Minnesota
Year	1992	1995-1998	1999
Volume Reduction in Light Snow	7-29%	—	—

Table 2 : Snow Effects on Volume

Factors\ Reducti on	Volume	Maximum Observed Flow	Capacity	Speed
Rain	-	0-20%	4-47%	-
Snow	7-47%	5-10%	37%	13-40%
Wind	-	-	-	9%

Table 3:Weather impact on Macroscopic parameters

III. APPLICATION

The chief plan is to choose such variable that provides much information to accomplish the proper division in each branch in other to sort the training

set. A benefit of Decision Tree classifiers is that rule may be inferred in distinction to the trees generated that are extremely illustrative, helping users for understanding their data. See5 software may generate both decision trees as well as decision tree rules depending on selected choice. The Trees as well as rules were generated using Ten fold cross validation and the outcomes with the least error on the test data set were selected. Table III presents the summary of the runs and the decision tree obtained from Run Number Six which had the least error.

IV. PROPOSED SYSTEM

Weather forecasting need prediction how the present situation of the atmosphere will change. Existing weather conditions are acquired by ground observations, like from ships & aircraft, Doppler radar & satellites. This information is transferred to meteorological centers where the data is being collected, checked and made into a different charts, maps, and graphs. Modern high-speed computers transfers the different 1000 of observations onto surface as well as upper-air maps. Computers draw the lines upon maps with the help from meteorologists, which corrects for any errors. A final map is termed as an analysis. Computers not only draw the maps but give prophecy how the maps will look few time in the future. The forecasting of weather by computer is termed as numerical weather prediction. To make out accurate prediction is one of the biggest challenge facing meteorologist in all over the world. Scientists have practiced to forecast meteorological characteristics using many methods, few of these methods being more correct than others. To predict the weather by numerical method, meteorologists have evolved atmospheric models that imprecise the atmosphere by using mathematical equations to relate by means of atmospheric temperature, pressure, and moisture will change over time. The equations are arranged into a computer and data over the present atmospheric conditions are fed into the computer. The computer computes the equations to decide how the different atmospheric variables will change over the next few minutes.

V. CONCLUSION

In this paper we have used data mining algorithm, we used Decision tree algorithm to classify weather variable such as high temperature, low temperature, rainfall and evaporation as well as wind speed in

terms of the month & year. The data which we have used from wouderground weather site between 2001 and 2010. The results represents how these variables have affect the weather observed in these months over the study period. Given much data the observed tendency over time may be studied and essential deviations which exhibit changes in climatic patterns identified. The results acquired were evaluated with the test data set prepared throughout with the training data and were found to be acceptable. Examine the small size of the data available for training as well as testing. To have a best result a huge data set which will be made up of data collected over many decades will be needed.

VI. FUTURE SCOPE

In upcoming research works neuro-fuzzy models will be used for the weather prediction procedure. This work is essential to climatic change studies because the variation in weather conditions in phrase of temperature, rainfall and wind speed can be studied using these data mining capability.

VII. REFERENCES

- [1]. Jiawei Han and Micheline Kamber Simon Fraser University Data Mining: Concepts and techniques .
- [2]. Introduction weather forecasting eprints.utm.my/11144/3/YenWeeKhunFSKSM2010C_HAP1.pdf
- [3]. Ankita joshi Weather Forecasting and Climate Changing Using Data Mining Application. International Journal of Advanced Research in Computer and Communication Engineering Vol. 4, Issue 3, March 2015 Copyright to IJARCC DOI 10.17148/IJARCC.2015.4305 19
- [4]. Application of Data Mining Techniques in Weather Prediction and Climate Change Studies Published Online February 2012 in MECS.
- [5]. Matillion.com/insights/real-life-applications-of-data-mining-and-business-intelligence
- [6]. Incorporating Weather Impacts in Traffic Estimation and Prediction Systems - ITS Report.html
- [7]. Casas D. M, Gonzalez A.T, Rodríguez J. E. A., Pet J. V., 2009, "Using Data-Mining for Short Term Rainfall Forecasting", Notes in Computer Science, Volume 5518, 487-490