

Neural Network based Weather Prediction Model towards Ideal Crop Selection

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Abstract: *Weather prediction system is one of the main important applications in agricultural field and it has been technologically and scientifically challenging problem around the world from the past few decades. Many of the crops depend upon ideal weather condition for example tea plants are very sensitive to sun light. If the tea plants are exposed to direct sun light or temperature beyond 32 degree centigrade the tea plants get die. In the same way if there is huge rain fall before Jawar crop, the crop might get damaged, similarly if the humidity is extremely high the cotton crop gets damaged, but we focus on only temperature, by seeing the temperature value only the farmers know which crop would be suitable for which weather condition. If a farmer knows that next year temperature will be quite high during the time of a particular crop, farmers might opt for another crop, without knowing that if farmer goes for same crop that crop might be damaged. In this project we will overcome from that problem, weather prediction system is very important to help the farmer to analysis before plan the seeds to know which crop would be better for the specific weather, not only the weather but also what type of soil is suitable for which crops is also considered. Data mining techniques can be used for predicting the weather forecast.*

In this paper we examine the use of data mining techniques for predicting the temperature, rainfall, humidity, wind speed, visibility and pressure. This can be obtained by using Multilayer Artificial Neural Network and also we use Median Filtering Techniques and we have to take the previous year weather data from 2005 to 2015 from agricultural department. A Predictive Neural Network model is developed for the weather prediction and the result is compared with real data. This information is helpful for the farmers before seeding the crop to get good yield out of particular crop.

Keywords: Data Mining Techniques, Artificial Neural Network, Median Filter.

1. Introduction

Improving the crop productivity is one of the most important challenges in the world, now a day's many of the farmers face this problem, this application is helpful for the farmers to get the good result of a particular crop, the most important thing is the farmer knows the weather condition before they seeds the crop, which crop should be suitable for which weather condition and which soil is suitable for which crops, if without knowing the weather condition and with suitable type of soil the farmer seeds the crops at that time some of the crops might damaged. Now a day's farmers face the problem of crops, they don't know which climate is appropriate for which type of crops and also they don't know which kind of soil is fit for which crops, but without knowing the upcoming weather conditions and with the type of soil imagine the farmers can seeds the crops at the point several crops might be damaged, for that we have to implement this project, in this project we will overcome from that problem. We are developing a system applying the data mining procedure and we have to use median filtering. We come with an output status to the farmers like in which month which is best crop for what we can grow up as well as we also implying the soil, what is the soil which is to be used, which is the soil is proper for which type of soil to be grow

the specific crop. Alone weather will not know let which is the best crop. Farmers recognize which is the best crop to grow for that particular weather, how means we have to get the last year data as input and we have to apply the filtering process. Following are the parameters temperature, pressure, humidity, rainfall, Wind Speed used in project. Generally in every area there will be a weather station, in every taluka level there will be a weather station they will put every sensor and then they will lock that data, that data will be available to the agricultural department as well as people nearer to that area for analysis.

2. Existing System

In the existing system we cannot find the probable weather conditions. Even though our computational system is very advanced and we have several software but we cannot predict the weather. Weather prediction system is one of the main important applications in agricultural field and it has been technologically and scientifically challenging problem around the world from the past few decades. Many of the crops depend upon ideal weather condition for example tea plants are very sensitive to sun light. If the tea plants are exposed to direct sun light or temperature beyond 32 degree centigrade the tea plants get die. In the same way if there is huge rain fall before Jawar crop, the

crop might get damaged, similarly if the humidity is extremely high the cotton crop gets damaged. Therefore a farmer cannot know before to seed the crop what weather and that weather will be ideal for the crop or not. So weather prediction system is very important to help the farmer to analysis before he plan the seeds to know which crop would be better for the specific weather, not only the weather but also what type of soil is suitable for which crops is also considered.

3. PROJECT DESCRIPTION, PROBLEM STATEMENT, OBJECTIVES OF THE STUDY, SCOPE OF THE PROJECT AND METHODOLOGY USED

3.1 Project Description

This is one of the applications for predicting the future weather and this function is very useful to the farmer to get a hold the good result of specific weather. The farmer can face the problem about crops that is, the farmer does not know which crop would be appropriate for which weather condition and also which type of soil, he don't know about all but he can seeds the crop at that time it might be suitable or it might not be for that we will develop this application that is very helpful for farmers to increase them crops.

3.2 Problem statement

The farmer when seeds the crops, at that time it might be good for that particular weather/soil or might not be good and but without knowing which type of soil is suitable for which crop some of crops get spoiled so that predicting the weather is very significant. If the weather is not suitable for that seeding crop, the particular crop would be broken or the farmer can lose them seeding crop and the farmer may not get good yield of crops.

3.3 Objectives of the study

1. To predict the probable weather condition.
2. To predict the suitable crop based on type of soil and Weather condition

3.4 Scope of the Project

The operating staff predicts and compares existing weather condition with past records. To predict the proper weather has been one of the major problems around the world, the purpose of the proposed work is to help the farmers to gain the knowledge about crops by seeing the weather condition and also which type of soils.

3.5 Methodology Used

Data mining technique are used as a domain and in that technique we used predictive data mining techniques, and also used the median filtering technique for smoothening the data and we used the algorithm like multilayer neural network and in the prediction we are using time series prediction. Data mining is one of the process of extracting the useful information from huge amount of data.

Some of the aspect of the data mining

1 Outliers

It is a part of the data but it is not trend of the data, when we provide a large set of data, in that data some of the data are outliers and this is an exception of the data, so if the data contains the outliers we cannot extract the meaningful information from data.

2 Filtering

Filtering means to find out there is an outliers form data and remove those outliers and also elimination of all outliers.

3 Smoothening

Eliminating the variations called smoothening.

The median filtering is a non-linear technique that reduces the noise and it replaces the centre value in the window with the median value of all the pixel value in the window. This filtering is used for remove the outliers from the data for example June month is the rainy season but sometime the whole 30 days the rain will not come, suppose day 1st to 20th day there is a rain fall but day 21st there is no rain fall and day 22nd to up to 30th day again there is a rain fall. In the whole month on day 21st data is outlier.

3.6 Algorithm

Artificial neural network is defined as it contains several internal layers between the input and output layers those internal layers are called hidden layers. When we append the loaded data and filtered data at that time artificial neural network can used and internally it can be work.

4. Literature Survey

The authors solve the weather forecasting problem, weather forecasting is one of the most complicated procedure, here the authors uses the two methods, using those two methods they can solve weather forecasting problem that is empirical approach and dynamic approach and after predicting the weather they say which climate it is and they uses the Decision tree algorithm, how to predict the present atmosphere, after predicting the atmosphere must be changed. This paper is helpful for how we have predict the weather, how the data is collected and analyzed, and where the data is collected etc. [1] In this paper a day-to-day analysis of weather is to be predicted and the forecasting should be communicated for end users for taking the decisions, and forecast the weather models based on the data mining and artificial neural network and they uses the Clustering technique, artificial neural network This paper is concentrate with various methodologies available in the area of weather forecasting and this paper presents the review of weather forecasting models based on artificial neural network. In this paper how the weather models can be forecast using the artificial neural network and data mining techniques. This paper is useful for finding the weather using some of the techniques and algorithms. [2] As name itself only it says how we have to predict the weather and after predicting the weather say which climate it is by using the data mining techniques and they uses the Artificial neural network, Decision tree algorithm. Summary of the result means using the previous year data we can say the future values by using the artificial neural network and decision tree algorithm. This application is very helpful for farmers how means with knowing the weather the farmer can seed crop he can getting better output, how means before seeding the crop he can analyze which crop is suitable for which

weather. This paper is relevant for finding the future values by giving the input as previous year data. This application is very helpful for farmers to getting good result of a particular crop. [3] Predicting the weather is one of the essential feature for preparing the best and worst of the climate, in this they find the accurate weather prediction because this is one of the most challenging problem in the world and they use the artificial neural network, regression, clustering, decision tree data mining. The review of data that using the data mining system for predicting the weather conditions to yield the best result. This papers collect the survey data, using those data we have to predict the future weather means next year weather by using the data mining techniques or by using the artificial neural network etc techniques. This paper is relevant for how the future value can be predicted by using artificial neural network and decision tree, regression, clustering techniques. [4] To finding the weather forecast problem by using the artificial neural network in data mining technique. Back propagation network and Hop field network are very important for forecasting the weather and these two networks is capable of yielding the better result of the crop. How to forecast the weather by using the artificial neural network and back propagation network and Hop field network. And for forecasting the data can available in metrological department. The paper is used for to predicting or to forecasting the future weather by using some of the techniques or some of the algorithms. [5] To classify and to predicting the future weather by using the back propagation algorithm. Using the previous year data, we have to classify data and will predict the future weather by using this algorithm. We have to take the data from weather department. This paper is relevant for forecasting the future weather. It includes the back propagation algorithm for predicting the weather [6]. At presently Indian has a typical condition for consisting of various seasons and geometrical condition, country has a very high temperature at Rajasthan and cold climate at Himalayas and most heavy rainfall at chirapunji, these variations in temperature make us to very difficult in effective weather prediction and K-means algorithm and J48 classification techniques along with linear regression analysis and Over a 12 year of temperature data, that temperature is increasingly changed ,that means minimum temperature, maximum temperature and that is found by k-means clustering analysis. In this paper we learned about how the Indian data sets can be analyzed by using data mining. This paper is useful for how to analyze the Indian weather data sets by using the data mining technique [7]. In this paper the authors can solve the crop selection problem and then how to maximize the net yield rate of the crop over a season and Statistical method or machine learning techniques. In the world the crop selection is one of the most important aspect or issue for agricultural planning and it depends on parameter namely market price, government policies, production rate and the authors can solve the crop selection problem and yield the market rate using the machine learning algorithm. This paper includes how the selection crop can be maximize the yield rate. The paper is relevant for using the machine learning technique how the selection crop rate can be maximize[8].

5. Conclusion

Improving the crop productivity is one of the major challenges in the present era. It has become immensely difficult to sustain the food requirements of evergreen population of India. Even with the availability of huge amount of agricultural field we have fail to produce good and efficient crops over sustain period of time, this is resulted from various parameter one of the most common cases is improper selection of the crops , farmers are often found to select a particular crop for a particular season without having the knowledge of probable environmental factors like temperature, rainfall for that duration and depending upon the soil condition, in this work we proposed a technique to predict the environmental parameters based on past data using time series prediction with multilayer perception neural network.

The proposed system can predict the day wise temperature, rainfall, humidity, wind speed based on the previous year data, based on this prediction we can then predict the best suited crop for a specific soil for the probable temperature value, our result shows that the system can predict the parameters with about 80% accuracy therefore it can be used to significantly improve the productivity of the crop by selecting the most appropriate crop suited for that specific weather under a specific soil condition

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