Profile Based Agriculture System

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Abstract - Agriculture is the most basic function to accomplish food demand all over the globe; it contributes nearly sixteen percent to total GDP(Gross Domestic Product) of India and ten percent of the total exports which helps in increasing foreign exchange. Agriculture is a backbone particularly in the developing countries like India. The population of India is continuously increasing and to meet the food necessities of this growing population, agricultural yield should be boosted. The application of Data mining techniques in agriculture especially on soils can improve cultivation yields in a better way as well as knowledge discovered from raw data is useful for many purposes. Data mining techniques are better choices for the same the analysis of soils plays an indispensable role for resolution making on several issues related to agriculture field. This Project presents the role of data mining in perspective of soil analysis in the field of agriculture by using various data mining techniques including classification algorithms such as SVM algorithm.

Keywords – Dataminig, Nutrition Values, Soil Dataset, SVM.

I. INTRODUCTION

Agriculture plays a vital role in Indian economy. Agriculture is considered as a primary means of livelihood for about 58% of the rural India. The green revolution which introduced various high yielding seeds and fertilizers undoubtedly leaded to increase in crop productivity. However, for the past 20 years scientific contribution in fields of agriculture is low compared to the technological inventions in services and manufacturing industries. Agriculture is now currently 15% of GDP as per Government of India Statistics. Indian farmers still follow the traditional way for selecting crops for cultivation which was passed onto them by their ancestors. There is no proper guidance available to assist them for cultivating appropriate type of crop using modern technologies. Thus using various data mining techniques, the proposed system provides the fertility of the soil, check nutrients and give idea about which crop will be grown when we added the nutrients which are less in soil. For this we are collecting temperature value, moisture value and Ph value from the dataset and further uses data mining algorithms to predict the type of crop which is appropriate for the given conditions.

In India, agriculture is largely influenced by rainwater which is highly unpredictable. Agriculture growth also depends on diverse soil parameters, namely Nitrogen, Phosphorus, Potassium, Crop rotation, Soil moisture, Surface temperature and also on weather aspects which include temperature, rainfall, etc. India now is rapidly progressing towards technical development. This technology will prove to be beneficial to agriculture which will increase crop productivity resulting in better yields to the farmer. The proposed project provides a solution for Smart Agriculture by monitoring the agricultural field which can assist the farmers in increasing productivity to a great extent. Weather forecast data obtained online such as temperature and rainfall and soil parameters repository gives insight into which crops are suitable to be cultivated in a particular area. This work presents a system, in form of an android based application, which uses data analytics techniques in order to predict the most profitable crop in the current weather and soil conditions. The proposed system will integrate the data

obtained from repository, weather department and by applying machine learning algorithm, a prediction of most suitable crops according to current environmental conditions is made. This provides a farmer with variety of options of crops that can be cultivated. Thus, the project develops a system by integrating data from various sources, data analytics, prediction analysis which can improve crop yield productivity and increase the profit margins of farmer helping them over a longer run.

II. LITERATURE REVIEW

DhareshVadalia, MinalVaity, KrutikaTawate, DnyaneshwarKapse determined the basic constituents of soil like pH and electrical conductivity which majorly affect the quality of soil. This system includes portable device which is made up using pH and EC sensors and Arduino board along with the analog to digital converter. Sensors sensed the pH and EC of particular soil sample gives the value to the Arduino board in real time. Analog to Digital Converter is used to convert analog ph value to digital value. Arduino board requires 9V power supply which is given by adapter and sensors require 3.3V-5V power. With the help of Arduino, pH value is converted into Nitrogen, Phosphorus and potassium which determines the soil quality. Arduino displayed NPK values on display screen and farmer have to manually enter NPK values in his own remote device application. Application will give digitally generated fertility report which contain suitable crops and required fertilizer.

"Agriculture Crop Pattern Using Data Mining Techniques "authored by M. Kaur et.al. This paper discusses how farmers can benefit by using modern data mining methodologies and thereby reduce costs, increase profits. Data mining can help agriculture firms in production practices such as: acquire new farmers, retain current farmers, performing sophisticated classification, correlation between crops scheme. In the agriculture sector, data mining can help government to increase yield advantage mainly to support decision making, reliable and timely information on crop area,

crop production and land use is of great importance to planners and policy makers for efficient agricultural development and for taking decisions on procurement, storage, public distribution, export, import and many other related issues to compete in the vend of crop pattern. In this research use following algorithm for data mining. K-means Clustering Algorithm.

The authors Thomas Truong; AnhDinh; Khan Wahid ,explain in this paper that the device is explain which give real time environmental data to cloud storage and a machine learning algorithm to predict environmental condition for fungal detection and prevention.

In machine learning algorithm using support vector machine regression (SVMr) was developed to process a raw data and predict result. SVM give result but it is less accurate than other algorithms.

The authors Mengzhen Kang; Fei-Yue Wang, explain in this paper that the concept of Knowledge Data Driven Model (KDDM)is used for new generation of smart agriculture which break the bottleneck of model application from laboratory environment to real world.

III. WORKING IN OUR SYSTEM

SVM:

"Support Vector Machine" (SVM) is a supervised machine learning algorithm which can be used for both classification and regression challenges. However, it is mostly used in classification problems. In this algorithm, plot each data item as a point in n-dimensional space (where n is number of features you have) with the value of each feature being the value of a particular coordinate. Then, perform classification by finding the hyper-plane that differentiate the two classes very well.

Support Vectors are simply the coordinates of individual observation. Support Vector Machine is a frontier which best segregates the two classes (hyper-plane/ line).

IV.   PROPOSED SYSTEM ARCHITECTURE

Fig (2) - System Architecture.
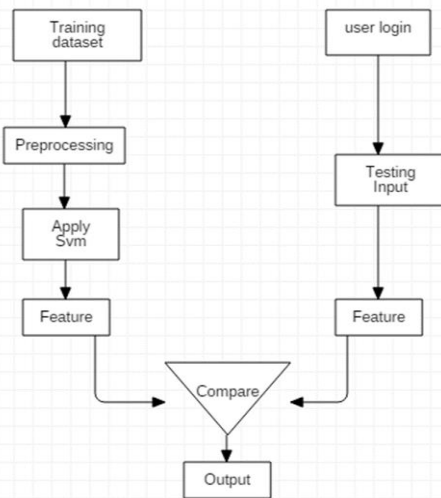
Fig(1) - Simple Representation of flowchart

In our proposed system user sign in our application by using username and password. If the user is registered then only he logged into the application. After that user will enter the nutrient values such as N, P, K, PH it will be compared with training dataset will get preprocessed and removes null values, noise and replicated data.

By applying svm algorithm, system will generate features and will compare with the user input and display output.

These are the following results:

- Fertility of the soil
- Status of nutrients
- Prediction of crops

The objective of the work is to predict –

1. Whether the soil is over fertility level , under fertility level or accurate by taking input from the past soil test paper(i.e. Profile) of the user(farmer) such as N,P,K,PH(nutrients of crop) and Fertility level.

2. To suggest the name of the crops which is suitable to the user's land according to the fertility level.

3. To predict which soil nutrient is less or more in the land of user to maintain the fertility level using data mining classification techniques.

CONCLUSION

In this paper, our application is mainly developed for the farmers. As farmers is the backbone of our nation. Hence this application will help to test the soil fertility and suggest which crop has to be planted. It also suggests the fertilizer which has to be added to the soil to increase the crop yield and which crops will yield in the less nutrients of current soil fertility. Farmers can view their previous searched result in history.

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REFERENCES

[1] Rakesh Kumar, M.P. Singh, Prabhat Kumar and J.P. Singh,"Crop Selection Method to Maximize Crop Yield Rate using Machine Learning Technique",Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, T.N., India. 6 - 8 May 2015. pp.138-145

[2] U.K. Shanwad, V.C. Patil and H. HonneGowda "Precision Farming: Dreams and Realities for Indian Agriculture", Map India, 2014

[3] Ramesh, D., and VishnuVardhan, B., "Analysis Of Crop Yield Prediction Using Data Mining Techniques", 2015

[4] Ramesh A. Medar and Vijay. S. Rajpurohit "A Survey of data mining techniques for crop yield prediction",IJARCSMS International Journal of Advance Research in Computer Science and Management Studies Volume 2, Issue 9, September 2014 pg. 59-64.

[5] S.Veenadhari,Dr. Bharat Misra ,Dr. CD Singh," Machine Learning Approach for forecasting crop yield based on climatic parameters", 978-1- 4799-2352-6/14/$31.00 ©2014 IEEE

[6] R. Sujatha, Dr. P.Isakki,A Study on Crop Yield Forecasting Using Classification Techniques, 978-1-4673- 8437-7/16/$31.00 ©2016 IEEE.

[7] Niketa Gandhi, Leisa Armstrong," Applying Data Mining Techniques to predict yield of Rice in Humid Subtropical Cl

[8]]N.Gandhi and L.J. Armstrong, "A review of the application of data mining techniques for decision making in agriculture", 2016 2nd International Conference on Contemporary Computing and Informatics (ic3i).

[9] S.Pudumalar, E. Ramanujam, R. HarineRajashreeń, C. Kavyań, T. Kiruthikań, J. Nishań, 'Crop Recommendation System for Precision Agriculture', 2016 IEEE Eighth International Conference on Advanced Computing (ICoAC).

[10] WEKA 3: Data Mining Software in Java, Machine Learning Group at the University of Waikato, Official Website: http://www.cs.waikato.ac.nz/ml/weka/index.html, accessed on 12nd October 2017.

[11] D. Ramesh and B. Vardhan, "Analysis of crop yield prediction using data mining techniques", International Journal of Research in Engineering and Technology, vol. 4, no. 1, pp. 47-473, 2015.