1. ABSTRACT

Crop Recommendation System for agriculture is based on various input parameters. This proposes a hybrid model for recommending crops to south Indian states by considering various attributes such as soil type, Rainfall, Groundwater level, Temperature, Fertilizers, Pesticides and season.

The recommender model is built as a hybrid model using the classifier machine learning algorithm. Based on the appropriate parameters, the system will recommend the crop.

Technology based crop recommendation system for agriculture helps the farmers to increase the crop yield by recommending a suitable crop for their land with the help of geographic and the climatic parameters.

The proposed hybrid recommender model is found to be effective in recommending a suitable crop. Crop yield production value updation has a positive practical significance for guiding agricultural production and for notifying the change in market rate of crop to the farmer.

The concept of this paper is to implement the crop selection method so that this method helps in solving many agriculture and farmers problems. This improves our Indian economy by maximizing the yield rate of crop production. Different types of land condition. So the quality of the crops are identified using ranking process. By this process the rate of the low quality and high quality crop is also notified.

The usage of ensemble of classifiers paves a path way to make a better decision on predictions due to the usage of multiple classifiers. Further, a ranking process is applied for decision making in order to select the classifiers results. This system is used to predict the cost of crop which is yielded for further.

2. INTRODUCTION

In the world of developing technologies, the success of sharing information will help the agriculturists in realizing and developing their potential. The information sharing is that the valuable and timely information is being shared between agriculturists, either formally or informally. The willingness of information sharing refers to the open attitude among agriculturists. This open attitude determines the degree and scope of information sharing. Using web-technologies like html and css we build the web application, we create dataset by gathering data from multiple resources and place them in place which is used to predict the price of the crop and results are subjected to non-linear test later priorities are set and rankings are given to the list of crops. Place information in our application and share that information to agriculturists whose data is collected and stored in the mysql server. we software to automatically send the updated information to the agriculturists in the form of text message. So that agriculturists no need to go to near by towns and cities to know the updated information. We will be machine learning algorithms to predict the price of the crop for the next two months. For prediction purpose we will be using Support vector machine(SVM), Naïve Baye's (NB) and K-Nearest Neighbour(KNN) algorithms to predict the cost of the crop production. Further, a ranking process is applied for decision making in order to select the classifiers results.

2.1 OBJECTIVE

- Data set collection from various sources.
- Data parsing and cleansing technique is applied to make the raw data into processing data.
- The data collected is subject to machine learning system along with run time analysis makes an efficient crop value updation system.
- Usage of Ensemble of classifiers makes the model more robust and efficient.
- Ranking technique used in the project helps us to make efficient decisions.
- Creating a web application for user registrations and collection of data.
- The main objective is to obtain a better variety of crops that can be grown over the season. The proposed system would help to minimize the difficulties faced by farmers in choosing a crop and maximize the yield.
- The model predicts the crop yield by studying factors such as rainfall, temperature, area, season, soil type etc.

3. LITERATURE SURVEY

[1]Title: A Review on Data Mining Techniques for Fertilizer Recommendation 2018.

Authors : Jignasha M. Jethva, Nikhil Gondaliya, Vinita Shah

To keep up nutrition levels in the soil in case of deficiency, fertilizers are added to soil. The standard issue existing among the Indian agriculturists choose approximate amount of fertilizers and add them manually. Excess or deficient extension of fertilizers can harm the plants life and reduce the yield. This paper gives overview of various data mining frameworks used on cultivating soil dataset for fertilizer recommendation.

[2]Title: A Survey on Data Mining Techniques in Agriculture, 2015.

Authors : M.C.S.Geetha

Agriculture is the most critical application area especially in the developing nations like India .Use of information technology in agriculture can change the situation of decision making and farmers can yield in better way.. This paper integrates the work of several authors in a single place so it is valuable for specialists to get data of current situation of data mining systems and applications in context to farming field.

[3]Title : AgroNutri Android Application,2016.

Authors : S. Srija, R. Geetha Chanda, S.Lavanya, Dr. M. Kalpana Ph.D

This paper communicates the idea regarding the making of AgroNutri an android application that helps in conveying the harvest particular fertilizer amount to be applied. The idea is to calculate the measure of NPK composts to be applied depend on the blanked proposal of the crop of interest. This application works depend on the product chosen by the farmer and that is taken as input, thus providing the farmers. The future scope of the AgroNutri is that GPRS can be included so that according to location nutrients are suggested.

[4]Title: Machine Learning: Applications in Indian Agriculture, 2016.

Authors: Karandeep Kaur

Agriculture is a field that has been lacking from adaption of technologies and their advancements. Indian agriculturists should be up to the mark with the universal procedures. Machine learning is a native concept that can be applied to every field on all inputs and outputs. It has effectively settled its ability over ordinary calculations of software engineering and measurements. Machine learning calculations have improved the exactness of artificial intelligence machines including sensor based frameworks utilized in accuracy farming. This paper has evaluated the different uses of machine learning in the farming area. It additionally gives a knowledge into the inconveniences looked by Indian farmers and how they can be resolved using these procedures.

[5]Title: Impacts of population growth, economic development, and technical change on global food production and consumption, 2011.

Author: Uwe A. Schneider a,⇑, Petr Havlik b, Erwin Schmid c, Hugo Valin b, Aline Mosnier b,c, Michael Obersteiner b, Hannes Bottcher b, Rastislav Skalsky´ d, Juraj Balkovicˇ d, Timm Sauer a, Steffen Fritz b

Throughout the following decades humanity will request more food from less land and water assets. This investigation evaluates the food production effects of four elective advancement situations from the Millennium Ecosystem Assessment and the Special Report on Emission Scenarios. partialy and jointly considered are land and water supply impacts from population development, and specialized change, and forests and agriculture demand request shifts from population development and economic improvement. The income impacts on nourishment request are registered with dynamic flexibilities. Worldwide farming area increments by up to 14% somewhere in the range of 2010 and 2030.Deforestation restrictions strongly impact the price of land and water resources but have little consequences for the global level of food production and food prices. While projected income changes have the highest partial impact on per capita food consumption levels, population growth leads to the highest increase in total food production. The impact of technical change is amplified or mitigated by adaptations of land management intensities

[6]Title: Brief history of agricultural systems modelling,2016.

Author: James W. Jones a,⁎, John M. Antle b, Bruno O. Basso c, Kenneth J. Boote a, Richard T. Conant d, Ian Foster e, H. Charles J. Godfray f, Mario Herrero g, Richard E. Howitt h, Sander Janssen i, Brian A. Keating g, Rafael Munoz-Carpena a, Cheryl H. Porter a, Cynthia Rosenzweig j, Tim R.Wheeler k

Rural frameworks science creates information that enables analysts to consider complex issues or take educated farming choices. The rich history of this science represents the decent variety of frameworks and scales over which they work and have been contemplated. Demonstrating, a basic apparatus in agrarian frameworks science, has been expert by researchers from an extensive variety of controls, who have contributed ideas and instruments over six decades. As agrarian researchers currently consider the "people to come" models, information, and learning items expected to meet the inexorably mind boggling frameworks issues looked by society, it is vital to check out this history and its exercises to guarantee that we stay away from re-innovation and endeavor to think about all elements of related difficulties. To this end, we outline here the historical backdrop of rural frameworks demonstrating and distinguish exercises discovered that can help control the structure and advancement of up and coming age of farming framework apparatuses and techniques. Various past occasions joined with generally innovative advancement in different fields have unequivocally added to the development of farming framework demonstrating, including improvement of process-based bio-physical models of yields and domesticated animals, factual models dependent on verifiable perceptions, and financial streamlining and reproduction models at family unit and local to worldwide scales. Attributes of rural frameworks models have changed broadly relying upon the frameworks included, their scales, and the extensive variety of purposes that spurred their advancement and use by specialists in various controls. Late patterns in more extensive joint effort crosswise over establishments, crosswise over orders, and between people in general and private segments recommend that the stage is set for the significant advances in rural frameworks science that are required for the up and coming age of models, databases, learning items and choice emotionally supportive networks.

[7]Title: A Smart Agricultural Model by Integrating Iot, Mobile and Cloud-based Big Data Analytics, 2017.

Authors: S.Rajeswari, K.Suthendran, K.Rajkumar.

In the cultivating field, the system models play a significant role to the enhancement of the agro-normal and money related conditions. In the proportions of benefits of the field and farm examinations to give the information and to recognize fitting and fruitful organization practices. It can recognize the organization to arrive managers and transversely over reality as long as the required soil, the board, environment, and money related information. Decision Support Systems (DSSs) use to make the information for the vermin the board, develop the officials. These systems are not using the impelled strategies to process the data. Thusly, use the adroit system thoughts to take the decisions for the issue. It expects a crucial activity in the comprehension of agronomic results, and their use as decision sincerely steady systems for farmers is extending.

[8]Title: An Overview of Internet of Things and Data Analytics in Agriculture: Benefits and Challenges, 2018.

Authors: Olakunle Elijah, Tharek Abdul Rahman, Igbafe Orikumhi, Chee Yen Leow, Nour Hindia.

A blueprint of Iot and DA in agriculture has been shown in this paper. A couple of zones related to the association of Iot in agribusiness have been discussed in detail. The investigation of composing exhibits that there are clusters of work advancing being produced of Iot development that can be used to increase operational efficiency and gainfulness of plant and creatures. The benefits of Iot and DA, and open troubles have been identified and inspected in this paper. Iot is depended upon to offer a couple of benefits to the agribusiness division. Regardless, there are up 'til now different issues to be steered to make it moderate for close to nothing and medium-scale farmers. The key issues are security and cost. It is typical that as contention increases in the cultivating part

[9]Title: Circulation Mode Selection Based on Cost Analysis, 2017.

Authors: Xiurong Sun*, Jingshan Zhang, Chenglin Wang, Tao Zhang

If every farmer and each average production base will join their optimal conditions in making cooperatives, it will accomplish economies of scale. Furthermore, producers will have an all the more favourable position in the plans with downstream firms (shipper or retailer).Second, the main customers of wholesale market are not inhabitants nearby who buy small quantities products but lower distributors or retailers. More redesigned transportation mode respects intensive attempt of new agrarian things, which prompts bolster the movement of new chain joint logistics and strengthen resource utilize and made logistics advantage quality. Refresh everything considered agrarian things spread. By then, regard the examination of gigantic worth control of standard things and achieve the mind blowing control to stream process.

[10]Title: Support Vector Machine-based Fuzzy Self-learning Control for Induction Machines, 2010.

Authors : Zongkai Shao

Using support vector machine (SVM) is to realize the self learning of fuzzy inference system (FIS), based on a fast modified varying metric method (MDFP) and a support vector machine identifier (SVMI), a SVM-FIS self-learning controller for the threephase induction machine adjustable speed system has been designed. The proposed controller is not only of the advantages that FIS does not depend on the plant model, strong robustness, and adaptive self-learning ability, but also learning ability and generalization performance of SVM. The designed processes of SVM-FIS, MDFP, and SVMI algorithms have been described in details. Simulation results show the feasibility, correctness and effectiveness of the proposed control strategy, such as the excellent static and dynamic performances, and strong anti-interference ability.

[11]Title: Machine Learning Facilitated Rice Prediction in Bangladesh, 2015.

Authors: Mohammad Motiur Rahman, Naheena Haq, Rashedur M Rahman

In this examination, self organising map (SOM) was utilized to group the information relationship between the information factors. After that chi-square test strategy was utilized to set up the level of reliance between the related variable qualities. It was discovered that the day by day outrageous climate conditions, for example, most extreme and least fluctuation in temperature, precipitation, dampness and wind speed were the principle drivers of product development, yield and wine quality

[12]Title: Support Vector Machine-Based Classification Scheme of Maize Crop, 2017.

Authors: Suhas S Athani, CH Tejeshwar

This paper says about, advancement of a mechanized framework to distinguish and group weeds from the products would be of extraordinary help and we have proposed a set-up that decreases labour. We have considered pictures of maize edits as the informational index. Separating surface highlights of the picture and applying SVM (support vector machine) to arrange whether the given picture is a weed or a yield brought about a precision of 82%. The proposed framework gives a chance to investigate more about element extraction methods.

[13]Title: WITH MACHINE LEARNING ALGORITHMS FOR ESTIMATING WINTER WHEAT AREAS, 2017.

Authors: Y.Z. Pan2

we utilize different kernel functions in the CPPI models to depict the connection between fractional winter wheat area and MODIS EVI time series data. We tried three straight and non-direct kernel functions, including linear regression, artificial neural system, and support vector machine.. For areas like DT where multiple crop types have comparative phenology cycles, ANN-CPPI is found to play out the best. The two crop types to be specific winter wheat and rapeseed, can be separated well. These tests give elective answers for the uses of CPPI in mixed areas.

3.1 EXISTING SYSTEM

The computational and data demands of structural price forecasting generally far exceed than what is routinely available in developing countries. Consequently, researchers often rely on parsimonious representations of price processes for their forecasting needs. Contemporary parsimonious form of price forecasting relies heavily on time series modelling. In time series modelling, past observations of the same variable are collected and analyzed to develop a model describing the underlying relationship. During the past few decades, much effort has been devoted to the development and improvement of time series forecasting models. Time series modelling requires less onerous data input for regular and up-to date price forecasting. Hence there is a need for better classification which would be an ensemble or hybrid classification model.

DISADVANTAGES OF EXISTING SYSTEM

- Efficiency is low.
- The existing system which recommends crop yield is either hardware-based being costly to maintain, or not easily accessible.
- Despite many solutions that have been recently proposed, there are still open challenges in creating a user-friendly application with respect to crop recommendation.
- More number of repeated work.