A Deep Learner based Smart Precision Agriculture System using Machine Learning Techniques

[1]M. Vengateshwaran, [2]N. Sumithra, [3]S. Pratheebha Rani, [4]B. Pravalika
[1]Assistant Professor, [2,3,4] UG Scholar
Department of Computer Science & Engineering
Agni College of Technology, Chennai

***Abstract*:** Precision farming is the latest trends in the agriculture sector which makes use of information technology to integrate all the procedures of farming from analyzing the soil-moisture intelligent irrigation scheduling system, weather forecasting and the quality of seed to predicting the real-time harvesting. Basically it focuses on the important aspect of inter-field and intra-field variability for growing crops. India is an agrarian country where agriculture is the backbone of economy and precision farming could be quite useful. Our paper enhance farming efficiency and increase sustainability through targeted management of agriculture land. Based on the real time field information and decision making, precision farming can optimize both farm productivity and profitability, which is the key goal of every successful farmer. This technique is implement using machine learning algorithm (Support Vector Machine).

Keywords: Precision Farming, machine learning , Support Vector machine.

I. INTRODUCTION

Precision agriculture refers to the precise application of agricultural inputs with respect to soil, weather and crop need in order to improve productivity, quality and profitability in agriculture. Precision farming enables farmers to use crop inputs more efficiently including pesticides, fertilizers, tillage and irrigation water. More effective utilization of inputs will bring in more crop yield and quality without polluting the environment and will result in sustainable agriculture and sustainable development. One of the main objective of our project is focusing new generation farmers. Since now, there was a ancestors for guiding farmers in future, the new generation farmers can guide by themselves through our intelligent system. Key technologies involved in precision farming include

- ❖ Global Positioning System(GPS)
- ❖ Geographic Information Systems(GIS)
- ❖ Variable Rate Treatment(VRT)

The Precision farming procedure can be summarised as follows:

i. Data pertaining to yield and potential yield-affecting factors are initially collected.
ii. Then analysed to determine which factors are actually affecting the yield.
iii. If yield is being affected, a farm manager decides the type, distribution and amount of treatment to apply.
iv. Remedial measures can then be carried out to ensure that the correct treatment is applied at the required rate and to the appropriate area within a field.
v. In effect, the spatial variability in field is managed through the manipulation of inputs such as fertilizers and pesticides.

Variable application of inputs may not always increase yields, but simply hold them constant whilst reducing input costs. Precision farming enables the farmer to reap increase profit through better management, and the application of more appropriate/reduced chemical treatments also helps to preserve the environment.

II. LITERATURE REVIEW

Yield Prediction is a vital feature of precision agriculture that utilizes farmland and weather data to help farmers increase crop production. Farmland data, which can be manipulated by man, can include land usage and preparation (tillage Vs no-till soil) depth of till, soil texture, soil structure, organic matter present, the amount of (nitrogen, phosphorus & potassium) fertilizers present and consumed, efficiency of water usage based on the type of irrigation scheme, crop rotation pattern, method for pest and weed control, total yield produced.

III. EXISTING SYSTEM

In the existing system of agriculture the crops are being monitored with the help of Arduino boards and GSM technology where in Arduino boards act as a microcontroller but not as a server. It is designed to increase long term, site-specific and whole farm production efficiency, productivity and profitability while minimizing unintended impacts on wildlife and the environment. It is not a technology; it is management Philosophy to respond to spatial variability.

DRAWBACKS OF EXISTING SYSTEM

➢ Precision agriculture techniques are still under development and requires expert advice before actual implementation.

- ➤ High capital costs may discourage farmers to not adopt this method of farming.
- ➤ It may take several years before the actual collection of sufficient data to fully implement the system.
- ➤ It is an extremely difficult task particularly the collection and analysis of data.

IV. PROPOSED SYSTEM

Smart farming systems reduce waste, improve productivity and enable management of a greater number of resources through remote sensing. The combination of smart irrigation and control being linked to local sensors, as well as sensing for pH and other environmental conditions, including insolation and local temperature. Remote monitoring through smart farming systems enables production yields to increase because farmers have more time to attend to their farm's real issues applying their expertise to solving problems with pests, watering in any location, amending soil conditions all through the use of sensing and automation. We newly introducing the concept "*Selling*" in the precision agriculture. In the proposed system, collecting input data from users such as air temperature, soil humidity, soil pH and rainfall the predicted crop and the accuracy level will be displayed. During analysis we can get the better results through Support Vector Machine Learning Algorithm. Comparing other precision system, where we can also add the selling and purchasing a farming products directly by the users.

ADVANTAGES OF PROPOSED SYSTEM

- ➤ Higher yields and more profitability
- ➤ Less waste
- ➤ Better quality produce
- ➤ Better accuracy
- ➤ More cost efficient farming
- ➤ Improved farming procedure
- ➤ Saves time

V. SYSTEM ARCHITECTURE
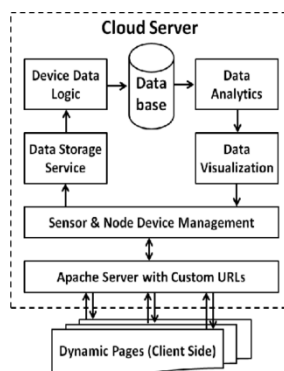
VI. SYSTEM MODULE

MODULE 1: LOGIN MODULE

The Login Module is a portal module that allows users to type a email id and password to log in. You can add this module on any module tab to allow users to log in to the system.

MODULE 2: REGISTER MODULE

This module will ask user to enter their name, email, mobile number and password. If later the user may forgot the password it will send the password reset instructions to the mail address. If the user has no idea about his/her user name or mail address is no longer valid user can contact for further assistance.

MODULE 3: PURCHASE MODULE

Purchase Module Streamlines procurement of required raw materials. It automates the processes of identifying potential suppliers, negotiating price, awarding purchase order to the supplier, and billing processes. Purchase module is tightly integrated with the inventory control and production planning modules. Purchasing module is often integrated with supply chain management software.

MODULE 4: SALES MODULE

Sales module is a highly integrated execution module. It draws most of its input from the following modules: Inventory module for verifying available and projected stock. Production module for production schedules and lead time of delivery.

MODULE 5: PREDICTION MODULE

Software predictors are useful to maintain the high quality of software product effectively. Where we can predict the crop which is suitable for the given input factors such as soil humidity, soil pH, rainfall air temperature. The objective of software prediction system is to find many benefits also defects.

VII. CONCLUSION

Farming is the major source for survival in this world, here the future Farming is also wearing foots towards these smarter technologies with newer improvements in order to increase the productivity with in short time. Focus on smarter, better and more efficient crop growing, a methodology is required. In order to meet these demands we added a new prediction term, through that will get a better result. Hence, hereby we conclude that the precision agriculture is about doing the right thing, in the right place, in the right way, at the right time.

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Authors Profile:

Mr.M.Vengateshwaran M.E.,
Assistant Professor in CSE
Agni College of Technology, Chennai
Area: Machine Learning, Big Data, Data mining, IR

N.Sumithra B.E.,
Agni College of Technology, Chennai

S.Pratheebha Rani B.E.,
Agni College of Technology, Chennai

B.Pravalika B.E.,
Agni College of Technology, Chennai