FERTILIZER RECOMMENDATION SYSTEM

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LITERATURE SURVEY

1.IOT DRIVEN ARTIFICIAL INTELLIGENCE TECHNIQUE FOR FERTILIZER RECOMMENDATION MODE

AUTHORS: Bhuvaneswari Swaminathan; Saravanan Palani; Ketan Kotecha; Vinay Kumar; Subramaniyaswamy V

Smart Farming Systems emphasize the need for modern technologies like the Internet of Things (IoT), Cloud and Artificial Intelligence (AI) in the agricultural process. The digital transformation accelerates conventional farming practices to increase crop production with quality. Earlier works failed to integrate AI with sensor technology, guiding agricultural practitioners in a successful direction. Therefore, we propose an architectural model with four layers, including sensor, network, service, and application, aid in deploying a smart farming system with limited energy consumption. Moreover, focusing on the application layer, we implement a deep learning approach to build a fertilizer recommendation system that

matches the expert's opinion. Finally, the whole system outcomes are presented as a single mobile application for farmers' ease of use.

2. NEURAL NETWORK BASED FERTILIZERS RECOMMENDATION SYSTEM FOR DISORDER CLASSIFICATION AND PREDICTION IN PETAL IMAGES

AUTHORS: N. Valarmathi; M. Vengateshwaran; Kalaimani Shanmugam;
R. Sudha

The point of farming isn't just to take care of the ever-developing populace but at the same time is a basic wellspring of vitality and an answer for the emergency of an Earth-wide temperature boost. Determination of plant ailment is basic for early finding and control of it. The unaided eye method is generally utilized for the conclusion of ailments. This methodology requires experts who can recognize varieties in leaf shading. Ordinarily a similar malady is characterized by a few specialists as a different sickness. This arrangement is exorbitant, in light of the fact that it requires nonstop expert management. Makers need to follow their yields and perceive the primary signs at modest costs so as to abstain from spreading even a plant malady and spare a lot of income. Recruiting qualified ranchers can't be reasonable especially in far off geologically detached zones. AI calculations in an image can give a substitute strategy to following plants and an expert can deal with such a way to deal with offer their types of assistance at a lower cost. It incorporates picture division which

incorporates the dynamic shape strategy and the picture arrangement approach which incorporates a neural system calculation for foreseeing various kinds of ailments. Or on the other hand grow the way to deal with suggest the composts dependent on the examination of power with estimations.

3. NEURAL NETWORK-BASED SOFTWARE FOR FERTILIZER OPTIMIZATION IN PRECISION FARMING

AUTHORS: D. Pokrajac; Z. Obradovic

A novel technique for providing fertilizer recommendation in precision agriculture is proposed. The method is based on the maximization of the profit function approximated using a decision support system based on artificial neural networks. The software implementation of the proposed approach is described and its use is illustrated on simulated realistic data. Experimental results suggest that the proposed technique is applicable for site-specific crop management.

4. GIS BASED FERTILIZER RECOMMENDATIONS FOR MAIZE ON A COUNTY SCALE

AUTHORS: Yixiang Sun; Zhenling Cui; Xinping Chen; Fusuo Zhang

Regional fertilizer recommendation is urgent needed for the National Soil Testing and Fertilizer Recommendation Program, which started at 2005 and has

already covered most counties of agricultural production area in China. This paper took Dong Chang Fu district, Liao Cheng city, Shandong province as an example, established a Geographic Information System (GIS) based fertilizer recommendation system for maize production. The results shown that, through Ordinary Kriging interpolation approach, agricultural soils in this district could be classified into three management zones for phosphorus fertilizer recommendation according to the soil available phosphorus testing (Olsen-P method) value <10, 1030, and >30 mg/kg, respectively. Recommended phosphorus fertilizer rates (P_2O_5) were 143, 95, and 48 kg/hm^2 respectively. Management zones for potassium fertilizer recommendation were created according to soil available potassium testing (NH_4OAc-K method) value <50, 50-100, and >100 mg/kg, respectively, while recommended potassium fertilizer rates (K_2O) were 90, 60 and 30 kg/ hm^2 , respectively. In conclusion, regional recommendations for phosphorus and potassium fertilizers are practicable on a county scale.

5. INTEGRATED ANN AND BIDIRECTIONAL IMPROVED PSO FOR OPTIMIZATION OF FERTILIZER DOSE ON PALAWIJA PLANTS

AUTHORS: Imam Cholissodin, Candra Dewi, Eunike Endariahna Surbakti

With the rapid advance of Science and Technology, especially in the field of agriculture. One of the most important aspects that are critical in agriculture is fertilizer. Within the application of fertilizer itself, there are many types of

fertilizers and a combination of different doses. Whereas palawija is a plant for crop rotation, that is planted after the rice cultivating season. Palawija is also grown in the highlands where rice cannot grow. Fertilizer application can give different impacts for Palawija. This paper will explain that with an Integrated Artificial Neural Network (ANN) and Bidirectional Improved Particle Swarm Optimization (BIPSO) can optimize the fertilizer dose on Palawija plants. The ANN method can be used to determine the effect on the plants arising from fertilizer application. After this, the user can input two of the effects on crops selected for optimization doses of fertilizer using BIPSO. The ANN method proved to be very good at predicting the value using training data and BIPSO is able to optimize the more than one vector thus fastening the process of the system. The smallest MSE value 8.6023E-03 is obtained from the test using 90% training data and 10% test data, iterating 100 times, with the number of hidden neuron at 10, learning rate of 0.6 and momentum of 0.6. The parameter values of BIPSO use standard parameters on Particle Swarm Optimization (PSO).

6. HEALTHY HARVEST: CROP PREDICTION AND DISEASE DETECTION SYSTEM

AUTHORS: Sambhav Bhansali; Punit Shah; Jinay Shah; Priyal Vyas; Poonam

Economy of India highly depends on agriculture. Still traditional ways of recommendations are used for agriculture. Currently, farmers use traditional ways

of approximations for amount of fertilizer used and the type of crop to be sown. Agriculture extremely depends on the type of soil and climatic condition of the region. Therefore, it becomes vital to create advancement in this field. With the help of Machine Learning and Deep Learning Techniques we will create a Web-App which will be one-stop solutions for information regarding the agriculture. Crop and fertilizer recommendation system will help the farmers in increasing their yield production. We are going to take the soil parameters along with the weathers API to figure out the most suitable crop for that region. Using the decision tree and navies bayes algorithm we will make the recommendation model which will use the N-K-P, Ph. value and rainfall as the parameters for training. Basis on the crop and region of farming we will recommend the fertilizer and its uses to boost the yield productivity for farmers. Sometimes due to unwanted excess of rainfall or the pest attack can cause disease to crops. We will use the image classification technique where the user can upload the picture of the affected plant/crop and the system will figure out the type of disease which will be done using Support Vector Machine (SVM) or using the neural network techniques. And this disease detection will suggest that how that plant/crop can be cure or prevent. The aim is to make a common system for all the features and provide the results with the best accuracy for all the crops over most of the regions all over the India. Also, the price and news section will keep the farmers updated with daily market prices and government schemes and policies related to the agriculture and farming.

7.CROP YIELD PREDICTION AND EFFICIENT USE OF FERTILIZERS

AUTHORS: S. Bhanumathi; M. Vineeth; N. Rohit

India being an agriculture country, its economy predominantly depends on agriculture yield growth and agro-industry products. Data Mining is an emerging research field in crop yield analysis. Yield prediction is a very important issue in agricultural. Any farmer is interested in knowing how much yield he is about to expect. Analyze the various related attributes like location, pH value from which alkalinity of the soil is determined. Along with it, percentage of nutrients like Nitrogen (N), Phosphorous (P), and Potassium (K) Location is used along with the use of third-party applications like APIs for weather and temperature, type of soil, nutrient value of the soil in that region, amount of rainfall in the region, soil composition can be determined. All these attributes of data will be analyzed, train the data with various suitable machine learning algorithms for creating a model. The system comes with a model to be precise and accurate in predicting crop yield and deliver the end user with proper recommendations about required fertilizer ratio based on atmospheric and soil parameters of the land which enhance to increase the crop yield and increase farmer revenue.

8. AGRO-MATE: A VIRTUAL ASSISTER TO MAXIMIZE CROP YIELD IN AGRICULTURE SECTOR

AUTHORS: Dayalini S; Sathana M; Navodya P.R. N; R.W.A.I.M.N Weerakkodi

Information Technology plays a vital role in the agriculture industry. The main goal of the project is to develop a mobile application to support farmers to take accurate decisions and help them with activities such as soil quality determination, best crop selection, rice disease prediction, and disaster prediction for the wet zone of Sri Lanka. To achieve the main goal the project has incorporated advanced technologies such as Deep Learning, Image Processing (IP), Internet of Things (IoT), and Machine Learning that can support farmers or investors in a way to maximize yield. 'Agro-Mate' application is developed in a way to facilitate the agriculture industry. 'Agro-Mate' consists of four components such as soil quality determination and fertilizer recommendation, best crop selection, rice disease prediction and recommendation, and natural disaster prediction and providing the recommendation. Also, the application suggests fertilizer when soil is lacking quality and provides recommendations whenever rice diseases or natural disasters are identified. The usage of android mobile devices in agriculture is one of the key components of the sector's growth, which facilitates the farmer's inaccurate decision-making to gain more quality and quantity of crops. Agro-mate' is more likely to increase the productivity of crops and indirectly increase the GDP of Sri Lanka.

9. A MACHINE LEARNING BASED NEW RECOMMENDATION SYSTEM TO THE FARMER

AUTHORS: D. N. Indira; M. Sobhana; A. H. L. Swaroop; V Phani Kumar

Totally 54% of India's land area is deemed arable, making it the world's largest agrarian economy. Soil infertility owing to over fertilization, as well as a lack of access and awareness of contemporary agricultural practices, are the different factors that contribute to low agricultural production. The main purpose of this research work is to develop a machine learning-based recommendation system to increase agricultural productivity. A variety of datasets were used in this study to design and develop advanced models to estimate the crop, recommend fertiliser, and identify plant disease. An algorithm called Mobile Net uses an image of a leaf to identify the disease present in a plant. The XG Boost model predicts a suitable crop based on the local soil nutrients and rainfall. Random Forest [RF] model was used to propose fertilizer and develop ideas for improving soil fertility depending on nutrients present in the soil. When compared to other approaches, the proposed model delivers a high level of accuracy.