LITERATURE SURVEY

1) Internet of Things (IoT) and Machine Learning Model of Plant Disease Prediction–Blister Blight for Tea Plant

Z. Liu, R. N. Bashir, S. Iqbal, M. M. A. Shahid, M. Tausif and Q. Umer, "Internet of Things (IoT) and Machine Learning Model of Plant Disease Prediction–Blister Blight for Tea Plant," in IEEE Access, vol. 10, pp. 44934-44944, 2022,
DOI: 10.1109/ACCESS.2022.3169147.

Z. Liu et al have proposed a solution for the early prediction of plant disease. They insisted that the occurrence of plant disease is mostly dependent on the environment. The environmental characteristics include temperature, rainfall, and humidity. So they produced a model based on Multiple Linear Regression(MLR) in Machine Learning. It detects the disease named blister blight of tea plant in an early stage . But the prediction of the disease is accurate to the point.

2) Improving the prediction accuracy of soil nutrient classification by optimizing extreme learning machine parameters

M.S. Suchithra, Maya L. Pai

Article history: Received 9 December 2018 Received in revised form 12 April 2019 Accepted 15 May 2019 Available online 21 May 2019

M.S. Suchithra and Maya L. Pai have proposed village-wise soil parameters aid to improve soil health and environmental quality. Problems are solved using the fast learning classification technique known as Extreme Learning Machine (ELM) with different activation functions like gaussian radial basis, sine-squared, hyperbolic tangent, triangular basis, and hard limit, The main reason for a heavy loss in soil quality is incorrect soil and crop management strategies. Also, excess use of chemical fertilizers has created imbalances in the availability of soil nutrients. This study analyses soil problems in the Kerala region. The ELM is a very fast and simple learning algorithm that predicts low, medium, and high fertility levels.

The radial basis function provides a better result in classifying soil problems. A neural network model to classify and predict soil fertility indices and pH values are created. The outcomes of this work help to make a machine learning decision system for Kerala Government to manage the soil nutrient deficiency problems. The results showed that optimizing ELM parameters could create a suitable model to classify soil fertility indexes

3) Less is More: Lighter and Faster Deep Neural Architecture for Tomato Leaf Disease Classification

S. Ahmed, M. B. Hasan, T. Ahmed, M. R. K. Sony, and M. H. Kabir, "Less is More: Lighter and Faster Deep Neural Architecture for Tomato Leaf Disease Classification," in IEEE Access, vol. 10, pp. 68868-68884, 2022,
DOI: 10.1109/ACCESS.2022.3187203.

S. Ahmed et al have suggested an effective way of detecting of leaf disease in tomato plants. This system extracts features using a combined model consisting of a pre-trained MobileNetV2 architecture and a classifier network for effective prediction. One of the major defects in this system is that they have taken the sample dataset of tomato leaves which are grown in a lab environment so it could affect the prediction of disease in a real environment.

4) Cardamom Plant Disease Detection Approach Using EfficientNetV2

S. C. K., J. C. D., and N. Patil, "Cardamom Plant Disease Detection Approach Using EfficientNetV2," in IEEE Access, vol. 10, pp. 789-804, 2022, DOI: 10.1109/ACCESS.2021.3138920.

S. C. K. has proposed a solution for the detection of plant diseases which includes Colletotrichum Blight and Phyllosticta Leaf Spot of cardamom plant and Black Rot, ESCA, and Isariopsis Leaf Spot of grapes with a high accuracy level. Added to that they used U 2 -Net to remove the unwanted background of an input image. But the defect is that they have only produced cardamom and grapes but we can extend it to furthermore plants.

5) Implementation of artificial intelligence in agriculture for optimization of irrigation and application of pesticides and herbicides

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Article history: Received 25 August 2019 Received in revised form 10 April 2020 Accepted 11 April 2020 Available online 22 April 2020

This paper proposes Artificial Intelligence in agriculture, The traditional methods which were used by the farmers were not sufficient enough to fulfill these requirements. Thus, new automated methods were introduced. These new methods satisfied the food requirements and also provided employment opportunities to billions of people. This technology has protected crop yield from various factors like climate changes, population growth, employment issues, and food security problems. The main concern of this paper is to audit the various applications of Artificial intelligence in agriculture such as for irrigation, weeding, and spraying with the help of sensors and other means embedded in robots and drones. These technologies save the excess use of water, pesticides, herbicides, maintain the fertility of the soil, also help in the efficient use of manpower and elevate productivity and improve quality. This paper surveys the work of many researchers to get a brief overview of the current implementation of automation in agriculture, and the weeding systems through robots and drones. The various soil water sensing methods are discussed along with two automated weeding techniques. The implementation of drones is discussed, and the various methods used by drones for spraying and crop monitoring are also discussed in this paper.

6) Intelligent insecticide and fertilizer recommendation system based on TPF-CNN for smart farming

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Article history: Received 6 June 2022; Received in revised form 16 August 2022; Accepted 4 September 2022

Many techniques are used to identify the pest, suggest medications, and do soil nutrient analysis techniques separately. This paper applies dual operator,

Transition Probability Function (TPF), and Convolution Neural Network (CNN) to process the pest's image discretely and continuously for applying the recommended insecticide. The mathematical model with the objective function is derived in this paper. The proposed system combines two major aspects of farming: pest identification and insecticide recommendation using machine vision and CNN. Secondly, the soil nutrient analysis uses a soil NPK sensor with the recommendation of fertilizers according to the obtained nutrient values. On-spot results are obtained, and the time required for insecticide recommendation is within 10 s, and for fertilizer recommendation, it is within 80 s. Successful identification of five pests, namely aphids, bollworms, leaf folder, leaf miner, and green stink bug, was done with more than 90% accuracy. The proposed approach is also compared with the other intelligent approaches, such as Artificial Neural Network (ANN), K-Nearest Neighbour (KNN), and Support Vector Machine (SVM), and it is observed that the proposed TPF-CNN approach gives higher accuracy in the shortest time.

7) End-to-End Deep Learning Model for Corn Leaf Disease Classification

H. Amin, A. Darwish, A. E. Hassanien and M. Soliman, "End-to-End Deep Learning Model for Corn Leaf Disease Classification," in IEEE Access, vol. 10, pp. 31103-31115, 2022, DOI: 10.1109/ACCESS.2022.3159678.

H. Amin et al proposed a system that detects the disease in corn plants. They have used an end-to-end deep learning model to identify healthy and unhealthy corn plant leaves. The model uses pre-trained convolutional neural networks (CNNs), EfficientNetB0, and DenseNet121.This method can be extended to different plants.

8) Beans Leaf Diseases Classification Using MobileNet Models

E. Elfatimi, R. Eryigit and L. Elfatimi, "Beans Leaf Diseases Classification Using MobileNet Models," in IEEE Access, vol. 10, pp. 9471-9482, 2022, DOI: 10.1109/ACCESS.2022.3142817.

E. Elfatimi et al have suggested a new way of predicting the disease of bean plan using MobileNet which is a convolutional neural network that provides an efficient model for mobile applications. And they achieved it using the real bean leaf images. They created a single dataset and compared the leaf of beans. One of the defects is that the classification training accuracy value decreases as soon as the batch size increases and the learning rate decreases.

9) Automatic Detection of Citrus Fruit and Leaves Diseases Using Deep Neural Network Model

ASAD KHATTAK, MUHAMMAD USAMA ASGHAR, ULFAT BATOOL, MUHAMMAD ZUBAIR ASGHAR, HAYAT ULLAH, MABROOK AL-RAKHAMI, (Member, IEEE), AND ABDU GUMAEI

This paper proposes an integrated approach to the convolutional neural networks (CNNs) model. The CNN model is intended to differentiate healthy fruits and leaves from fruits/leaves with common citrus diseases such as black spot, canker, scab, greening, and Melanosis. The proposed CNN model extracts complementary discriminative features by integrating multiple layers. The CNN model was checked against many state-of-the-art deep learning models on the Citrus and PlantVillage datasets. According to the experimental results, the CNN Model outperforms the competitors in a variety of measurement metrics. The CNN Model has a test accuracy of 94.55 percent, making it a valuable decision support tool for farmers looking to classify citrus fruit/leaf diseases.

10) Detection and Analysis of Behavior Trajectory for Sea Cucumbers Based on Deep Learning

JUAN LI , CHEN XU , LINGXU JIANG, YING XIAO, LIMIAO DENG, AND ZHONGZHI HAN

J. Li, C. Xu, L. Jiang, Y. Xiao, L. Deng, and Z. Han, "Detection and Analysis of Behavior Trajectory for Sea Cucumbers Based on Deep Learning," in IEEE Access, vol. 8, pp. 18832-18840, 2020, DOI: 10.1109/ACCESS.2019.2962823.

This paper proposes a detection, location, and analysis approach of behavior trajectory based on Faster R-CNN for sea cucumbers under the deep learning framework. The designed detection system consists of an RGB camera to collect the sea cucumbers' images and a corresponding sea cucumber identification software. The experimental results show that the proposed approach can accurately detect and locate sea cucumbers. According to the experimental results, the following conclusions are drawn: Sea cucumbers have an adaptation time to the new environment. When sea cucumbers enter a new environment, the adaptation time is about 30 minutes. Sea cucumbers hardly move within 30 minutes and begin to move after about 30 minutes. Sea cucumbers have negative phototaxis and prefer to move in the shadows. Sea cucumbers have a tendency to the edge. They like to move along the edge of the aquarium. When the sea cucumber is in the middle of the aquarium, the sea cucumber will look for the edge of the aquarium. Sea cucumbers have unidirectional topotaxis. They move in the same direction as the initial motion direction. The proposed approach will be extended to the detection and behavioral analysis of the other marine organisms in marine ranching.