

PLANT GROWTH AND DISEASE DETECTION

Priya Nandhini¹, Swathi², Ramesh³, Narmada⁴

^{1,2,3} Student, Department of CSE, Institute, SNS College of Technology, Coimbatore, India.

⁴ Assistant Professor, Department of CSE, SNS College of Technology, Coimbatore, India.

Abstract - Plant growth and disease detection of the plant has been a major cause and threat in agricultural field and it has been a major threat to food security. Several processes are being done in order to detect disease in plant. Several technologies and methods are being used in disease detection and classification of the disease. But identification of plant disease has been a difficult task. The traditional way of detecting plant diseases does not provide a clear objective about the plant disease. This paper proposes accurate, exact and reliable identification and detection of plant growth and plant diseases. The concept of image processing is being implemented which helps in easy identification of plant disease. Crop management system such as precision agriculture which helps to know the variability of crops which occurs temporarily is being used in this project. Plant phenotype which provides information about anatomical, physiological, onto genetical, biochemical is being used in this project.

classification of leaf diseases can be done accurately which is the key to prevent the agriculture loss and food loss. Different plant leaf bears different diseases. Various symptoms that are used for plant disease diagnosis are described. The bio tic agents can affect the progression of the symptoms that can be classified as primary or secondary. The symptoms of a pathogen can be expressed as fungal or bacterial leaf spots, vein banding, mosaic appearance, the leaves can be distorted or a powdery mildew can appear. Air pollution or chemicals can also make harm to the plants. So the detection of these diseases and their symptoms are very important for a healthy plant or crop growth which determines the food chain of living beings. Hence we can choose our plant and explore several ways to cure its disease and make its growth rapid by using the website.

2. LITERATURE SURVEY

Ijarcce Issn, [1] The methods for identification of the plant diseases and classification like pattern recognition method, neural network, back propagation are discussed. The basic concept of plant disease detection in leaf and various parts of the plants and trees are also discussed.

Yolanda Gil, [2] This research focuses on the intelligent assistance. They have investigated the uses of the intelligent agents and to automate them. They have collected a large corpus from the users and developed a paraphrase based approach. This approach is used to match the agent capabilities. They have also investigated on the personal tasks and assistance that can be offered to the users by elaborating the basis of the sub step knowledge.

the user tasks have been explored using management application which is deployed in a social networking site. The main benefits of using the knowledge and data to interpret has been discussed. The list of valuable ways to create repositories has been showed.

Patil, J. Kumar, [3] The study of plant and their diseases refer to the study of visual pattern observation of a particular plant or tree. These days the plants and crops face different types of diseases. Usage of insecticide or fertilizers are not always efficient and even may cause damage to soil and crops. It can be harmful for the animals and birds and can even affect the food chain. The efficient way to avoid this is by detecting the

Key Words: Precision Agriculture, Plant Phenotyping

1. INTRODUCTION

The growth of country's economy and the civilization mainly depends on the agriculture and its productivity. In such case the proposed technique proves to be beneficial in monitoring large fields of crops and also in detecting the disease. The automatic detection of diseases helps to detect the disease in early stage which makes it easier and efficient in plant or crop growth. Diseases on plants and crops leads to the tremendous reduction in both the quality and quantity of agricultural products. The detailed study on plant diseases refer to the studies of visually observable patterns on the plants and their growth. Monitoring the diseases on the plants or crops plays a vital role in successful cultivation of crops in the farm and results in larger quantity and quality of food. The monitoring and analysis of plant diseases were done manually by the farmers with their naked eyes in the former days. But this requires large amount of work and also requires excessive processing time. So the image processing techniques can be used in the plant disease detection which will reduce the stress and increases the work efficiently. The detection and

percentage of effected area and to estimate the damage in the plant caused by the disease .This paper gives a detailed and advanced methods on the study of increasing the efficiency of the crops and reduce the effects of the disease caused on the plants and crops.

Kulkarni, A. Patil, [4] The detection of the plant diseases in their early stage has been proposed in this paper. The disease can be identified earlier and accurately using diverse image processing technique and artificial neural network. Framers find it really difficult to change from one disease control policy to another and it is difficult to observe and classify the disease using naked eyes. The aim is to develop a simple disease detection system for identifying the plant diseases. The process starts with capturing the image of the plant that has been affected by the disease. It is then filtered and segmented using Cabor filter .The texture and colour features are then extracted from the results. Artificial neural network (ANN) is then used to distinguish the healthy and diseased area.

Monishanker Halder, [5] The disease classification techniques an algorithm for image segmentation technique are used for the automatic detection and classification of the plant diseases. Jute, Brinjal, Paddy, okra are some of those crop species on which the algorithms and methods were tested. The related diseases for those plants were taken for the identification. With a very less computational effects maximum results were obtained. This also shows the efficiency of the algorithm in disease recognition and classification .The plant diseases can be identified at early stage or the initial stage which is another advantage of using this method. Artificial Neural Network, Bayes Classifier, Fuzzy Logic and hybrid algorithms are used to improve the image recognition rate in the classification process.

Dhiman Mondal, [6] The efficient technique of detecting and classifying the presence of YVMV disease in okra leaf with the use of image processing, K-means and Naive Bayesian classifier has been explained. This technique has been experimented on 79 standard diseased and non-diseased okra leaf images to detect the different classification of diseases in okra . The leaf images of the input are of four types ,namely Highly Susceptible (HS), Moderately Susceptible (MS), Tolerable (T) and Resistive (R). The proposed technique is said to be achieving an 87% success rate using 10 features. This technique helps in identifying the diseases in okra.

M.S. Arya, [7] Detecting plant diseases using image processing is the proposed idea. Image processing toolbox of the Mat lab is used for the purpose of measuring the affected area of disease in the plants and it is used to determine the difference in the colour of the disease affected area in the crops. This method has been used to detect the symptoms and effects of any type of plant and crop diseases that is affected on different horticulture crops. This reduces the risky task of

monitoring the farm crops at very early stage to detect the symptoms of diseases that appears on plant leaves.

Tanvi Mehra, [8] The tomato maturity based on color and fungal infection in the tomato leaves are determined in this paper. Initially threshold algorithm was performed to determine the maturity of tomato. This helps to make the system more generalized and self adapting to k-means clustering algorithm. A comparative analysis for both the methods has been done to analyze the method. The unconventional machine system has also been used that scrutinizes the leaves emerging out of the soil and it depends upon leaf spots. It analyzes the nature of the fungal disease and its depth into the stem of tomato. k-means algorithm along with threshold is used for segmentation of image and eventually identifying fungus. The fungus part that has been segmented, is then studied to get the accurate percentage of presence of the disease.

3. PROPOSED METHODOLOGY

The web application provides information about plant diseases, The web application provides effective way for users to know about the plants ,their growth, the factors that causes diseases ,the symptoms that a plant can have once when it is affected by disease and the precaution steps that can be used to prevent the plant further. The web application provides users a friendly way to know about plant growth process and all the necessary steps required for the plant growth .The users can also have ideas from the experts and scientists to know about the plant growth and plant diseases. The multi-lingual web application serves as an Eco-friendly platform application in which the plant diseases can be detected using image processing in which the image is being processed, analysed and the disease is being predicted using the concept of machine processing.

The concepts of deep neural networks is used in mapping the image and picture of the disease affected plant as an input to the related crop disease as an output, which as a result helps in knowing the disease caused after the process of prediction. The web application has data set description, collection and images of several plants as the database which helps in plant disease detection. Therefore the accuracy of plant growth and the detection of plant diseases is achieved using these approaches in this web application which as a result provides a feasibility demonstration to the users and the farmer.

Crop diseases --> Tomato Leaf .

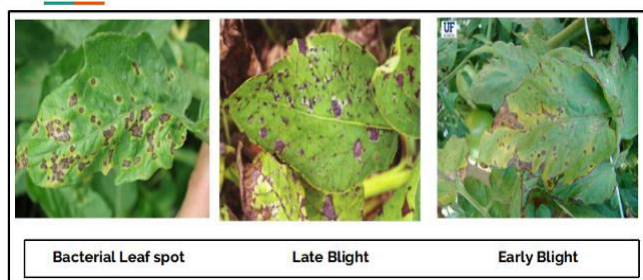
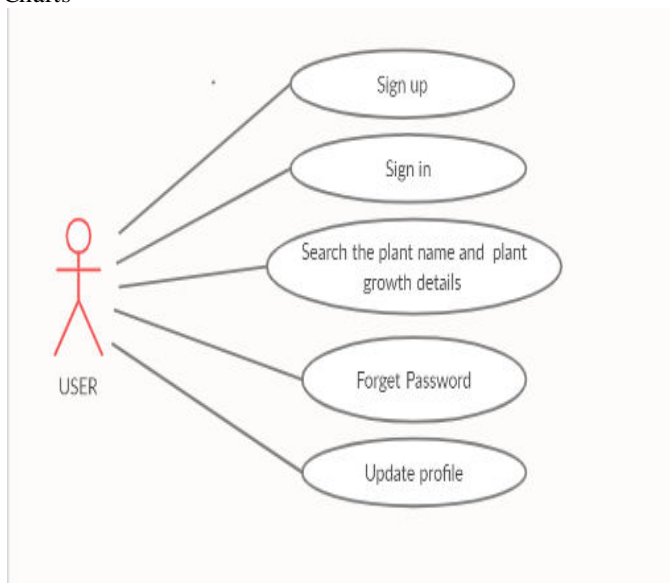


Fig -1: Crop Disease

Charts



4. CONCLUSIONS

This approach provides easy ,effective and user friendly application to know about plant growth and the diseases caused by the concepts of identification ,detection and prediction and diagonalisation of disease caused in plants. It also helps to identify the disease and provides additional information about the fertilizers and pesticides that can be used for the cure of the disease on the plant.

REFERENCES

- [1] Ijarce Issn A Survey On The Plant Leaf Disease Detection Techniques.
- [2] Yolanda Gil, Varun Ratnakar, Timothy Chklovski, Paul Groth, Denny Vrandecic Capturing Common Knowledge About Tasks: Intelligent Assistance For To-Do Lists”
- [3] Patil, J.; Kumar, R. Advances In Image Processing For Detection Of Plant Diseases. J. Adv. Bio inform. Appl. Res. 2011, 2, 135–141.
- [4] Kulkarni, A.; Patil, A. Applying Image Processing Technique To Detect Plant Diseases. Int. J. Mod. Eng. Res. 2012, 2, 3361–3364.
- [5] Monishanker Halder, Ananya Sarkar, Habibullah Bahar, Plant disease detection by image processing A LITERATURE

REVIEW(2019)SDRP Journal of Food Science & Technology 3(6)

[6] Dhiman Mondal, Dipak Kumar Kole, Aruna Chakraborty, D. Dutta Majumder" Detection and Classification Technique of Yellow Vein Mosaic Virus Disease in Okra Leaf Images using Leaf Vein Extraction and Naive Bayesian Classifier., 2015, International Conference on Soft Computing Techniques and Implementations- (ICSCTI) Department of ECE, FET, MRIU, Faridabad, India, Oct 8-10, 2015.

[7] Detection of unhealthy plant leaves using image processing and genetic algorithm with Arduino2018 International Conference on Power, Signals, Control and Computation (EPSCICON).

[8] Tanvimehera,vinaykumar,pragya gupta "Maturity and disease detection in tomato using computer vision" 2016 Fourth international conference on parallel, distributed and grid computing(PDGC).