International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 05 | May 2020 www.irjet.net p-ISSN: 2395-0072

GREEN LEAF DISEASE DETECTION BY USING ARTIFICIAL NEURAL NETWORK

Mrs .T Nivethitha[1], R Sathish[2], S Shanmuga Priyan[3], S Vignesh[4]

[1]Assistant Professor, [2,3,4]UG Scholar
[1,2,3,4]Department of Electronics and Communication Engineering,
Hindusthan College of Engineering and Technology, Otthakalmandapam, Coimbatore, India.

Abstract : Agricultural productivity is the issue on which indian economy extremely depends on. This is often the one in all the explanations that malady detection in plants plays a very important role in the agriculture field, as having the malady in plants are quite natural. If correct care isn't taken during this space then it cause serious effects on plants and because of that various product quality, amount or productivity is affected. Detection of disease through some automatic technique is helpful because it reduces an oversized work of watching in huge farms of crops, and at terribly early stage itself it detects the symptoms of diseases means that after they seem on plant leaves. Our project presents a neural network algorithmic program for image segmentation technique used for automatic detection still as the classification of plants and survey on completely different diseases classification techniques that may be used for plant leaf disease detection. It requires tremendous amount of work, expertise in the plant diseases, and also require the excessive processing time. Hence, image processing is used for the detection of plant diseases. Disease detection involves the steps like image segmentation, feature extraction and classification. Our project discussed the method used for the detection of plant diseases using their leaves images.

Keywords – *Disease detection, Quality*

1. INTRODUCTION

India is the land of diversity not only in culture but also in foods. India is an agriculture country, where 70% of Indian population is relay on agriculture. Wheat is the good source of trace minerals such as selenium and magnesium. Some nutrients are essential for good health. This project focuses more on the scale of single leaf based disease detection rather than the scale of whole plant. Rust is the foliar disease of wheat. Leaf rust damages the wheat leaf most. Fungal disease, viral disease and there are so many. Image processing and machine learning technique over support vector machine have been extensively explored for plant disease study for their merits of invasive, rapid, continuous and precise measurement capacities. Characteristics of wheat diseases, it has been found that wheat disease mainly concentrates on the wheat leaves and can be identified by computer vision techniques. Today India ranks second worldwide in farm output. Agriculture is still the largest economic sector and plays a major role in socioeconomic development of India. Agriculture in India is the means of livelihood of almost two thirds of the workforce in India. India has over 210 million acres of farm land. Jawar, wheat, sunflower, cereals are the major crops. Apple, banana, sapota, grapes, oranges are the most common fruits. Sugarcane, cotton, chili, groundnuts are the major commercial crops. Computer Vision Systems (CVS) developed for agricultural applications, namely, detection of weeds, sorting of fruits in fruit processing, classification of grains, recognition of food products in food processing, medicinal plant recognition, etc. In all these techniques, digital images are acquired in a given domain using digital camera and image processing techniques are applied on these images to extract useful features that are necessary for further analysis. Plant disease diagnosis is an art as well as science. Many diseases produce symptoms, which are the main indicators in field diagnosis. The diagnostic process (i.e., recognition of symptoms and signs), is inherently visual and requires intuitive judgment as well as the use of scientific methods. The photographic images of symptoms and signs of plant's diseases used extensively to enhance description of plant diseases are invaluable in research, teaching, diagnostics, etc. Plant pathologists incorporate digital images using digital image transfer tools in diagnosis of plant diseases. Till now experts. Identify the presence of the disease in the plants manually, but it is expensive for a farmer to consult an expert due to their distant availability, so it is required to detect the symptoms of the plant diseases automatically as early as they appear on the plant. Early detection will help farmers to avoid huge loss. Technology support would help them in early detection of the diseases, cutting on cost of pesticides, and good returns for the efforts, thus making the profession attractive. To remedy this situation various alternatives are being searched to minimize the application of these hazardous chemicals. One of the main concerns of scientists is the automatic disease diagnosis and control. Several key technologies incorporating concepts from image processing and artificial intelligence are developed by various researchers in the past to tackle this situation.

A computational model that works in a way similar to the human brain 's neurons. Each neuron takes an input, carries out certain operations and passes the output to the next neuron. The main objective of any neural network is to eliminate the need to design feature vectors by hand. The neural network attempts to mimic the working of a brain, where only raw input is present with the image and get the

output directly. The various applications in image processing could be the classification of images, automatic annotation of images etc. There are two common ways to do image processing in neural network i.e. using gray scale and using RGB values.

1.1 LITERATURE REVIEW

[1]. Early detection and classification of plant diseases with support vector machines based on hyperspectral reflectance

Automatic methods for an early detection of plant diseases are vital for precision crop protection. The main contribution of this paper is a procedure for the early detection and differentiation of sugar beet diseases based on Support Vector Machines and spectral vegetation indices. The aim was (I) to discriminate diseased from non-diseased sugar beet leaves, (II) to differentiate between the diseases Cercospora leaf spot, leaf rust and powdery mildew, and (III) to identify diseases even before specific symptoms became visible. Hyperspectral data were recorded from healthy leaves and leaves inoculated with the pathogens *Cercospora beticola, Uromyces betae* or *Erysiphe betae* causing Cercospora leaf spot, sugar beet rust and powdery mildew, respectively for a period of 21 days after inoculation. Nine spectral vegetation indices, related to physiological parameters were used as features for an automatic classification.

[2]. Predicting the spread postharvest disease in stored fruit,with application to apples

Postharvest diseases can cause considerable damage to harvested fruit in controlled atmosphere storage. Since there is a large cost associated with opening the storage rooms, regular assessment of damage levels is not feasible, and many experts agree on the need for a reliable predictive model. Presented here is a simulation model that predicts the overall incidence of disease in a bin of stored fruit as a function of initial infection levels and the fruit's susceptibility to fungal attack.

[3]. Detection and classification of pests from crop images using support vector machine

Agriculture is the mother of all culture. Economy and prosperity of a country depends on agriculture production. Agriculture provides food as well as raw material for industry. Agriculture production is inversely affected by pest infestation and plant diseases. Early pest identification and disease detection will help to minimize the loss of production. Naked eye observation is a common using method to identify the pest. But it is time consuming process. In this paper we proposed an automatic pest identification system using image processing techniques. Color feature is used to train the SVM to classify the pest pixels and leaf pixels. Morphological operations are used to remove the unwanted elements in the classified image.

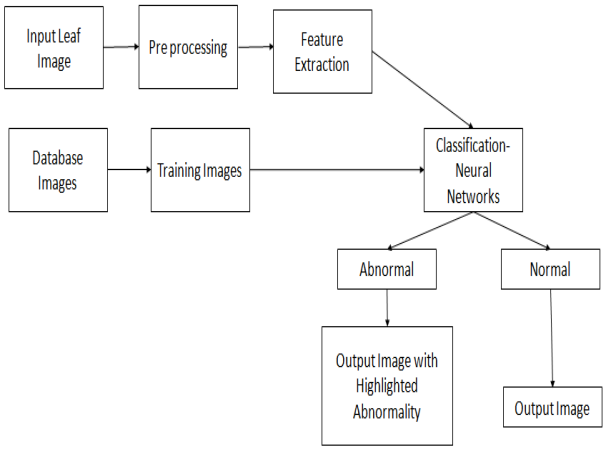
[4]. Identification of alfalfa leaf diseases using image recognition technology

Common leaf spot (caused by *Pseudopeziza medicaginis*), rust (caused by *Uromyces striatus*), Leptosphaerulina leaf spot (caused by *Leptosphaerulina briosiana*) and Cercospora leaf spot (caused by *Cercospora medicaginis*) are the four common types of alfalfa leaf diseases. Timely and accurate diagnoses of these diseases are critical for disease management, alfalfa quality control and the healthy development of the alfalfa industry. In this study, the identification and diagnosis of the four types of alfalfa leaf diseases were investigated using pattern recognition algorithms based on image-processing technology. A sub-image with one or multiple typical lesions was obtained by artificial cutting from each acquired digital disease image.

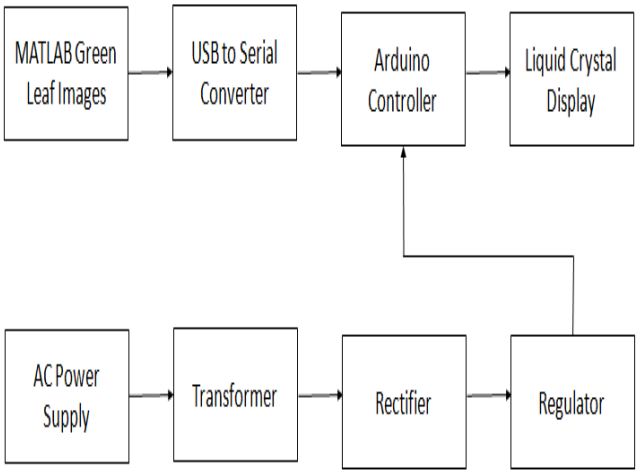
2. HARDWARE AND SOFTWARE USED

- Arduino Controller
- USB to Serial Converter
- Liquid Crystal Display
- Personal Computer
- Transformer
- Rectifier
- Regulator
- MATLAB

3. BLOCK DIAGRAM MATLAB PART



3.1 BLOCK DIAGRAM HARDWARE PART



Working principle

There are many techniques that are presently being utilized to make computer-based vision systems victimization options of plants extracted from pictures as input parameters to varied classifier systems. A method to argument already existing techniques of plant leaves identification system is represented. In this project, a brand new classification model involving neural networks (NN) was utilized to develop a matlab based system which uses pc based vision system for automatic identification of leaf disease in wheat plant based on an input from arduino which is used in the field. The matlab is used for identifying the Green leaf images and using the Neural Network codings it separates a normal leaf from an infected leaf and based on that output the Arduino displays the result on an liquid crystal display.

ADVANTAGES

- High Accuracy
- Low complexity
- Detection of images been classified without any noise.

REFERENCES

1. Diseased plant leaves using Neural Network Algorithms K. Muthukannan, P. Latha, R. Pon Selvi and P. Nisha Department of ECE, Einstein College of Engineering, Anna University, Tirunelveli, India Department of CSE, Government College of Engineering, Anna University, Tirunelveli, India ARPN Journal of Engineering and Applied Sciences , VOL. 10, NO. 4, MARCH 2015, ISSN 1819-6608

2. Detection and Classification of Leaf Disease using Artificial Neural Network Malvika Ranjan1, Manasi Rajiv Weginwar2, Neha Joshi3, Prof. A.B. Ingole4 International Journal of Technical Research and Applications e-ISSN: 2320-8163, www.ijtra.com Volume 3, Issue 3 (May-June 2015), PP. 331-333

3. Leaf Disease Classification using Artificial Neural Network Syafiqah Ishaka, Mohd Hafiz Fazalul Rahimana, Siti Nurul Aqmariah Mohd Kanafiahb, Hashim Saadc Syafiqah Ishak et al. Jurnal Teknologi (Sciences & Engineering) 77:17 (2015) 109– 114

4. Deep Neural Networks Based Recognition of Plant Diseases by Leaf Image Classification Dubravko Culibrk,2 and Darko Stefanovic1 Hindawi Publishing Corporation Computational Intelligence and Neuroscience Volume 2016, Article ID 3289801, 11 pages http://dx.doi.org/10.1155/2016/3289801

5. Plant Disease Classification Using Convolutional Networks and Generative Adverserial Networks Emanuel Cortes Stanford University ecortes@stanford.edu

6. Soybean Plant Disease Identification Using Convolutional Neural Network Serawork Wallelign Jimma Institute of Technology, Ethiopia LAB-STICC, ENIB, France wallelign@enib.fr Mihai Polceanu LAB-STICC, ENIB, France polceanu@enib.fr C´edric Buche LAB-STICC,ENIB,France