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Smart System for Agricultural Raw Food And Fruits

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Abstract: This paper deals with the detection of the plant disease using image processing technique and proposes a system which will detect the values such as the soil moisture of the plant, humidity level and pH level of the water using sensors. It also detects if insects or pests are within a 10 meter distance of the plant.. The images are threshold to particular values after that detected image threshold are masked over the original image. The image is clustered based on the features using k- means clustering, GLCM algorithm would generate the features from the images.

Keywords: **Raw food ,Fruitl, Volatile matter,Matlab.**

1.INTRODUCTION

In recent years, the demand of building automation system has increased. Automation helps reducing consumption of electricity, decreases the wastage, uses less manpower, and helps in energy saving. Image processing and computer vision in agriculture is another fast growing research field. In crop nitrogen detection, image processing can be used for estimation of plant nitrogen detection and chlorophyll detection. In pest control, image processing is a good tool for detection of pest infected areas because it favors to build up the pest population. Food quality can be improved by quality inspection using computer vision. Sorting of agricultural products is done based on presence of good quality fruits. An image contains important information that can be retrieved by using some computational method. Image segmentation is a task for partitioning an image into smaller parts that are more meaningful. Interestingly, it can be stated as identification and classification of some region of interest. Soft computing methods generally do not require human intervention they perform the segmentation task automatically. Plants play an important role in all the aspects of life. They serve as a backbone to sustain the environment. Plants do suffer from diseases, which affects the normal growth of plants. These diseases affects the complete plant including leaf, flower, fruit and stem. Detection of such plant diseases is an important task to perform [1].The existing method for the identification and classification of diseases from a plant is done with the help of human intervention. Experts through naked eye make observations about the diseases of a plant by continuous monitoring of plants over a large period of time [2-5). Most of the time, these existing approaches of disease identifications are time-consuming and cumbersome. So to monitor the plant disease at an early stage, use of some automatic method can be quite beneficial. [6-10] proposes The plant serves as the basic need for any living organisms. They are the most important and integral part of our surroundings. Just like a human or other living organism does plant do suffer from different kind of diseases.

2.MATERIALS AND METHODS

GLCM has been used extensively in the field of image processing. It has been for texture analysis in gray scale as well as colour texture recognition. Clustering value of a pixel captures the structure of local brightness variations in atmosphere and SVM Classifier is used to classify the result. The proposed system are shown in figure.1

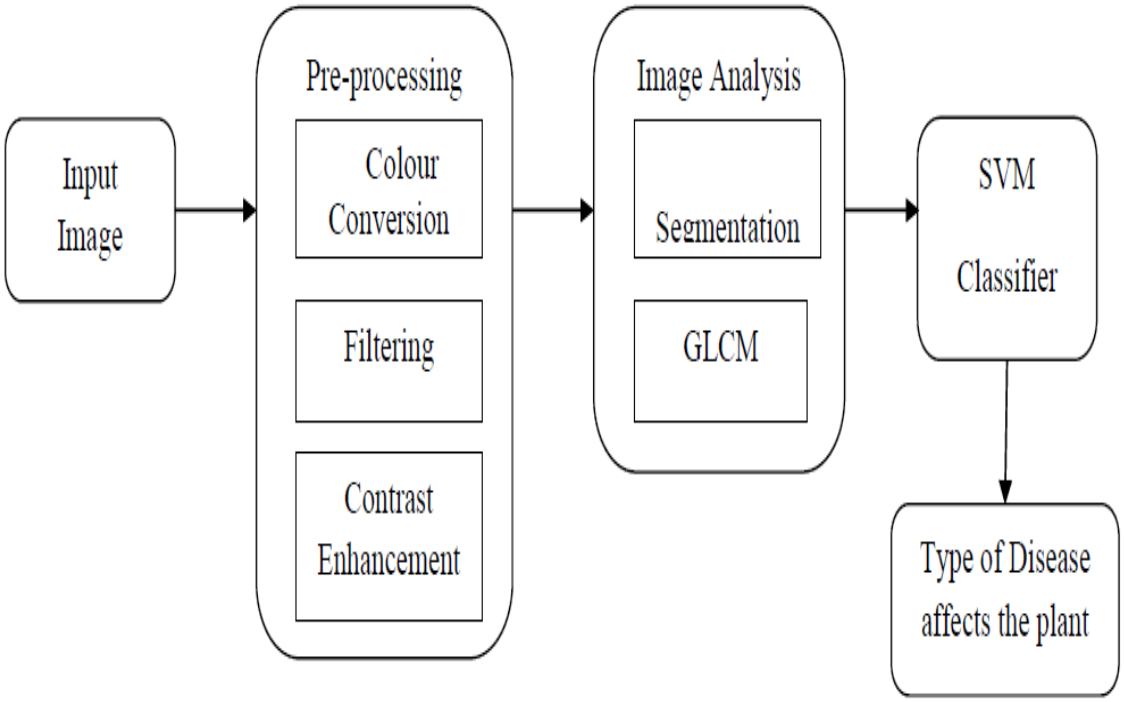

Figure.1 Proposed System unit

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The plant maintenance is done_automatically with the help of microcontroller which helps in irrigation of the plant as well as operate the chemical motor (pesticide). The soil moisture sensor helps to find out soil moisture content. The humidity sensor detects the cooling level of the plant. Matlab is used to find out the insect damage in the leaf using image processing. The Matlab software is also used to detect the cultivation of vegetables, inspect fruits and to find out whether the fruit cultivated status is good or bad. Switch based Ultrasonic Sensor is used to prevent the plant from unwanted animals which would destroy the plants or vegetables or fruits. The proposed system experimental and simulation results are shown in figure.2 & 3.

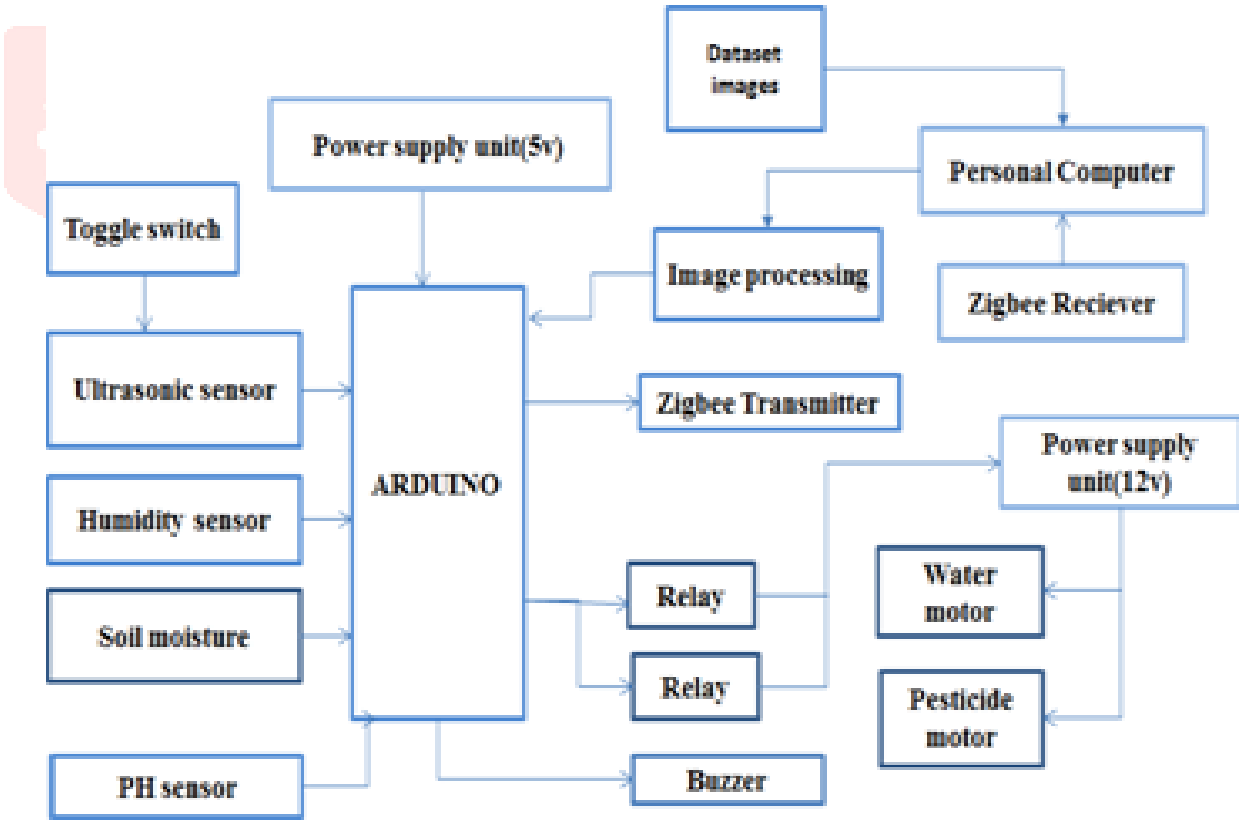

Figure.2 Proposed system experimental unit

3.RESULTS

INPUT IMAGE:

The RGB color model is an additive color model in which red, green and blue light are added together in various ways to reproduce a broad array of colors. The name of the model comes from the initials of the three additive primary colors, red, green and blue. In photography and computing, a grayscale or greyscale digital image is an image in which the value of each pixel is a single sample, that is, it carries only intensity information. Images of this sort, also known as black-and-white, are composed exclusively of shades of grey, varying from black at the weakest intensity to white at the strongest. In photography and computing, a grayscale or greyscale digital image is an image in which the value of each pixel is a single sample, that is, it carries only intensity Grayscale images are distinct from one-bit bi-tonal black-and-white images, which in the context of computer imaging are images with only two colors, black and white (also called bi-level or binary images).

Figure.3 Affected leaf (a)Input image (b)Gray image

Grayscale images have many shades of gray in between. Grayscale images are often the result of measuring the intensity of light at each pixel in a single band of the electromagnetic spectrum (e.g. infrared, visible light, ultraviolet), and in such cases they are monochromatic proper when only a given frequency is captured. But also they can be synthesized from a full color image; see the section about converting to grayscale. information. Images of this sort, also known as black-and-white, are composed exclusively of shades of grey, varying from black at the weakest intensity to white at the strongest. Input and gray image are shown in figure.3.

Table.1 shows the sample list.

Sample	Affected Vegetable	Extraction	Ash	Moisture content
	(%)	(%)	(%)	(%)
Sample 1	15.37	73.09	2.88	8.68
Sample 2	14.82	72.77	3.71	8.70
Sample 3	17.43	73.24	1.09	8.24
Sample 4	13.93	73.46	3.29	9.32
Sample 5	18.08	73.33	0.91	7.68
Sample 6	19.82	71.44	1.20	7.54
Sample 7	10.23	76.09	4.87	8.81
Sample 8	12.07	73.94	5.44	8.55
Sample 9	11.67	74.64	4.19	9.50
Sample 10	18.90	67.91	3.83	9.36

The Matlab coding is executed and the fingerprint are shown in figure 6 module software page is opened. The fingerprint image which is already stored in the database is given as input. Based on the identification the authorized user can access the database.The leaf database carries out the clustering process after feature extraction and segmentation the result is obtained regarding the disease of the plant. The SVM classifier gives the Disease type. Figure.4 shows the Experimental prototype for monitoring Fruit and vegetable. Table.1 shows the sample list.

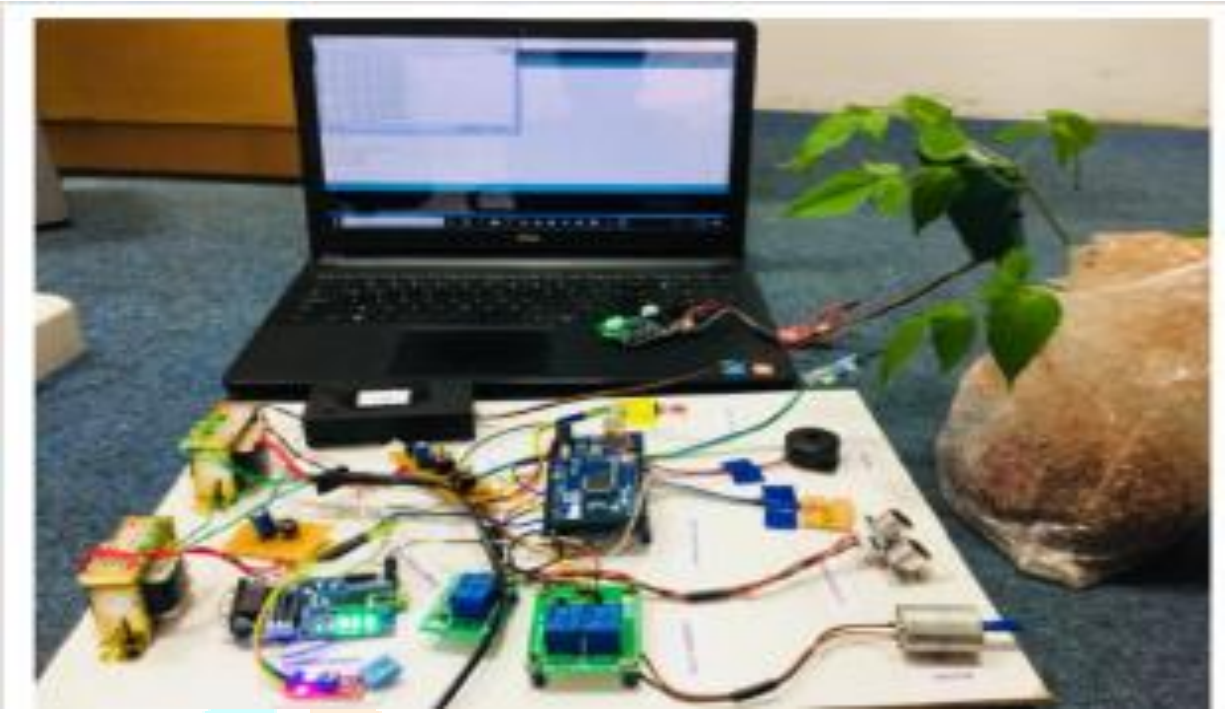

Figure.4 Experimental prototype for monitoring Fruit and vegetable

CONCLUSIONS

The plant disease detected were made by skin leaf techniques by means of intensity computation, thresholding and features extraction. The diseases are classified as true or false exudates with the help of SVM classifier and were able to distinguish between four different types of grading level with an average accuracy of 94.17%. Basically our project would give a system which includes classifiers using Image processing techniques. Also features extraction techniques are proposed with different types of grading.

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