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A Survey on Fruit Quality Inspection Using K-Means Segmentation

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Abstract **-** In recent era, the Agricultural production (ex. Fruits) has increased rapidly .So it become very difficult to detect the Quality of Fruit. This leads towards a need of scalable solution. As to satisfy today's requirement, we are proposing a system which gives better result for detection of Fruits quality efficiently. Serialized Database is used to store the image features. The different database is a used to store different types of images according to system requirement .It is also able to analysethe another disease related to detected disease. This approach provides solution for defect segmentation of fruit. Proposed approach will improves defect segmentation quality related to precision and computational time.

***General Terms*:** Methodology for fruit quality inspection

Keywords: *K-Means, Defect Segmentation, Fruit Images, Image Processing.*

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I. INTRODUCTION

Background:

Modern agricultural technology is extreme advance. The value of fruit is directly related to the quality of fruit [1]. It is an difficult to decide the quality of fruit in agricultural science and technology. The traditional method of fruits quality inspection is very time consuming. Diseases in fruit cause major and serious problem in economic and financial losses and production in agricultural industry worldwide. Manual identification of defected fruit is very time consuming. Digital images are important key medium of conveying information. Obtaining the information from images and understanding them such that this information can be used for evaluating many tasks is an important characteristic of Machine learning.

Diseases in fruit cause serious problem in economic losses and production in agricultural industry worldwide. Manual identification of defected or infected fruit part is very time consuming. The classical approach for detection and identification of fruit diseases is based on the naked eye observation by the experts. In some developing nations, experts required for quality inspection are expensive and time consuming due to the distant locations of their availability. Therefore, this work present a novel defect segmentation of fruits based on color features with K-means clustering unsupervised algorithm. A solution for the detection and Classification of fruit diseases is proposed..

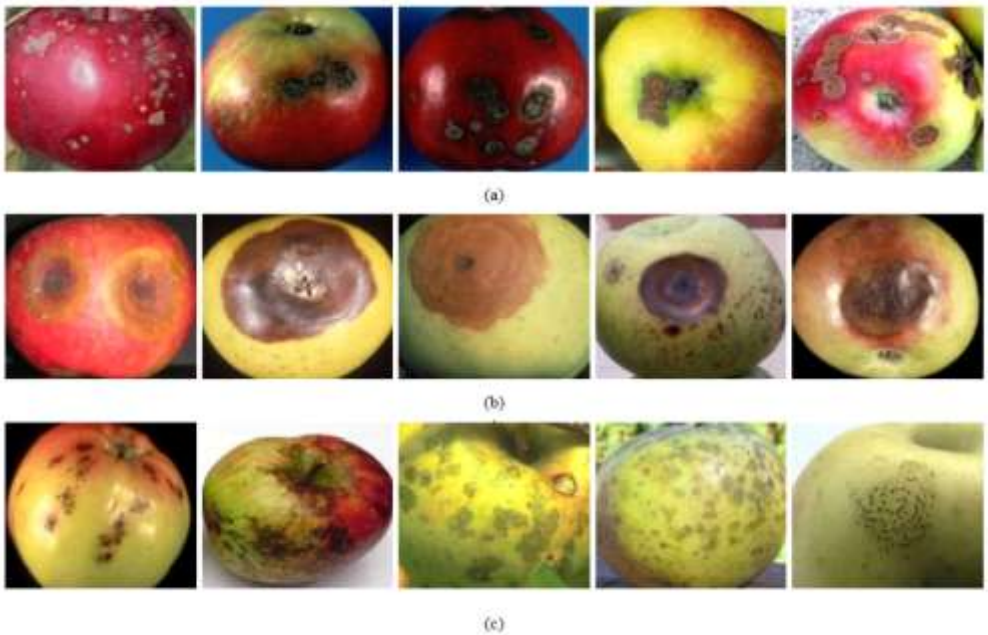

Fig: Sample images from the dataset infected with (a)apple scab ,(b) apple rot ,and (c) apple blotch diseases

For example, extracting malign tissues from the human body scans etc. form an integral part of Medical diagnosis.

First, for understanding given images, image segmentation is initial step and then find different objects between them. Segmentation of the image is nothing but the pixel classification. It is treated as necessary operation for meaningful interpretation of acquired images. Image segmentation methods are based on one of two properties of the intensity of image pixels: similarity and discontinuity. The image processing based approach is contain following main steps[1] K-means clustering segmentation method is used for image segmentation.2] some state of features are extracted from the segmented image. Based on the discontinuity or similarity criteria, segmentation methods can be classified into six sections: 1)Boundary Detection, 2) Physical Model approach,3) Region based methods ,4)Clustering(K-Means clustering).5) Histogram based Method , 6) Neural Network.

II. RELATED WORK

In this paper[2] author explained that implementation of a new a technique. This technique contain color texture segmentation. Above technique is for a generalization of the standard K-Means algorithm. Author explained that the images should be defined by homogenous regions with respect to texture and color. If images defined by homogenous regions with respect to texture and color, after standard K-Means algorithm applied to images it produces accurate segmentation results .Author stated that the novel and deep implementation of technique to select the proper colours from the input image .For that selection of proper colours use the information from the color histograms.
As in paper [3] ,image processing is used in many computer vision, pattern recognition and with applications in industrial and scientific field(s) such as Microscopy, Medicine, content-based image and video retrieval, Remote Sensing, document analysis and quality control, industrial automation

In this paper [4] author stated as the efficiency of color image segmentation may significantly influence the quality of an image understanding system.
Paper [5] tells all about non-invasive and non-destructive fruit quality inspection. This method use to produce theme based on fruit surface color. Further author has given detailed explanation regarding this method as follows. Author has suggested that, an input image is firstly in the RGB color 1 model. Then the image is converted from the RGB color model to the HIS color mode. In HIS color model segmentation is based on hue value to separate the fruits and its background. According to the author, after this the simple and significant histogram of hue H and saturation S of fruit's surface color were calculated .The output of the BP network was the quality description of the respected fruits. After giving examples of input samples to system , the quality of fruits was inspected by the BP network . BP network work according to the histograms of H and S of fruits surface color. According to the experiments taken by the author shows the feasibility of the proposed fruit quality inspection method in reliable manner. The experiments taken by the author for the quality detection of bananas gives satisfied results.

III. PROPOSED SYSTEM

System Workflow:
In proposed system architecture, we take the photo by using external device such as camera of any fruit and that image is converted into grey scale. The conversion is from colour image to grey scale is done by using any grey scale algorithm .This grey scale image is considered as a input for thresholding. After thresholding boundary detection is done. Cropping process is carry out after boundary detection .Then this input image is converted to HSV from grey scale color model. Then calculate the current centroid value for each block. Finally store this image as a training data.

A testing data that is, a fruit image will given as a input. This image will also process from all these algorithms. And compare this testing data with training data. finally, at last, the testing fruit image will classify as good or bad.

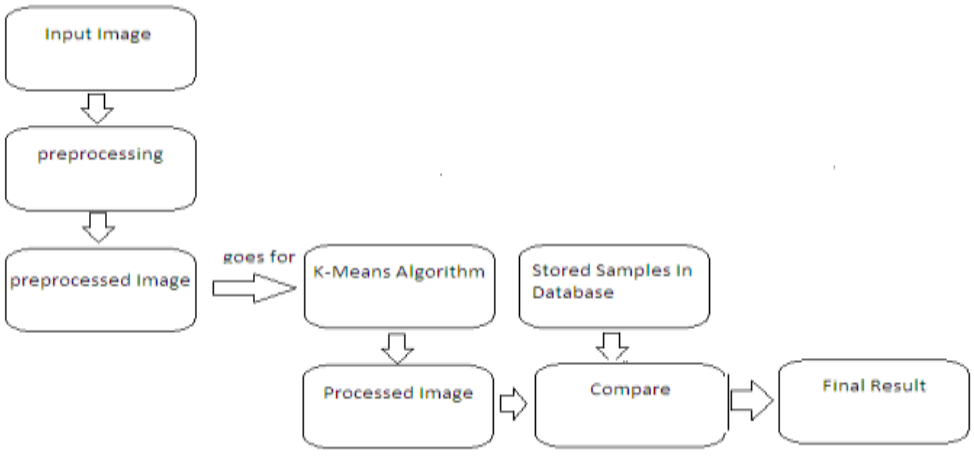

Fig: Proposed system with ontology learning and SASF crawler.

Algorithms

Fruit Quality Inspection Using K-means Clustering will provide facility to recognize the defected fruit part. For this, we will use following algorithms:

Which are Thresholding, RGB to Grey Scale Conversion and K-means Clustering Algorithm.

1.Thresholding

Thresholding is the one of the method of segmentation. For thresholding input is grey scale. Thresholdingcanbe used to create binary images that is image with only black or white colours. Thresholding is used for feature extraction. The required features of image are converted into black and everything else to white(or vice-versa).

2. RGB To grey Scale Conversion

The original input image is in the form of RGB color format. First apply RGB separation on the given image, separate the RGB colours in the image and then convert the image into Grey colour by using Grey Scale Conversion algorithm.

3.K-means Clustering Algorithm

K-means clustering algorithm is making the groups of pixels present in an image. It is an unsupervised clustering method. K-means clustering algorithm classifies the pixels in the image into multiple classes on the basis of their distance from each other.

IV. CONCLUSION AND FURTHER WORK

In this survey paper, we are presenting our idea as software which will be able to detect the fruits quality. There are various techniques like Histogram based, edge detection technique, color clustering, Physical Model based approach. The proposed approach will use K-means clustering technique for segmenting with clusters.A framework for the defect segmentation of fruits using images is proposed.

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