Quality Identification of Wheat by Using Image Processing

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Abstract:
In the current scenario the farmers are taking more efforts in their farm and also spending more time and money, for getting more outcomes. But in front of their hard work they will not getting expected amount and profit of their products means grains. Image based wheat quality examination mechanism that can swap dreary visual investigations for virtue, shading, and size attributes of grains. Model transferability between various review machines was likewise tried. The proposed technique is defined with the assistance of computerized image processing mechanism on MATLAB. In this paper three parameters; types of wheat, Foreign Particle and Admixture of Agmark Standards are changed over to computerized structure for advanced quality examination of wheat.

Keywords: Wheat, MATLAB, Image Processing, Color feature extraction, Image Segmentation, Quality Identification.

I. INTRODUCTION

In the field of agriculture every farmers have been taken so many efforts honestly and doing hard work for getting quality of grain or outcome. But according to area wise climate, type of soil, seed and fertilizers the quality of the crop will be categorized manually by traditional method. In the traditional method experts are identifying the quality of grain by handpicking. Likewise the inspection of the quality of different types of wheat manually is critical and time consuming. So to replace this very tedious and time consuming process of identifying the good qualities grain especially wheat manually we are going to introduced a smart computerized system which is, “Quality Identification of Wheat by Using Image Processing”. Here, approach used is based on image processing technology, the detection, classification of wheat grain to identify quality are performed in this paper. Taking wheat grain as an example, the shape detection and description method of similar round object are studied firstly. Then a grain shape description method based on some feature points of wheat grain Boundary is proposed. Aiming at wheat seed detection, a simple image size calibration method based on black-white grid is put forward too.

The quality classification of wheat, from the nature of their texture, shape, and color essence, it is tedious work using image processing but we are making use of MATLAB software to classify the wheat in their respective categories. In the present grain-handling situation, grain sort and quality are recognized physically by visual examination which is repetitive what's more, not precise. There is requirement for the development of quick, precise and target framework for quality determination of nourishment grains. In this paper we are going to categorized three major types of wheat (i.e. Lokwan, Narmada, Sarbati) according to its qualities and morphological features. This paper proposes a model that utilizes shading and geometrical highlights as properties for characterization. A decent grouping exactness is accomplished by utilizing highlights as, HSB hues and geometrical components.

II. LITERATURE REVIEW

Here we are summarized some related work of different authors who are studying and analyzed the results of their research on the similar track by using computerized Image Processing technique.

K. Hatou 2011(1) presented a study aimed to diagnose the hanging of the stress to the plant by using images. The position where the influence of the stress appears first was a flower. Shape changes into the flower that receives the stress. Therefore, it was assumed that the stress condition of the plant can be diagnosed from the morphological characteristics such as a shape of the flower. The substantial change appears in the number of sheets of the petal, the number of stigma, and the size of the flower. An image diagnosis system for detecting the strength of the stress occurred in the plant was developed using an artificial neural networks.

Naiqian Zhang 2002(2) have presented the Grain Check 310 is a real-time, image-based wheat quality inspection machine that can replace tedious visual inspections for purity, color, and size characteristics of grains. It also has the potential for measuring the vitreous ness of durum wheat. Different neural network calibration models were developed to classify vitreous and non-vitreous kernels and evaluated using samples from GIPSA and from fields in North Dakota. Model transferability between different inspection machines was also tested.

Mandeep Saini 2012(3) have research in terms of total production tonnages used for food, India is currently second to wheat as the main human food crop and ahead of maize. Determining the quality of wheat is critical. Specifying the quality of wheat manually requires an expert judgment and is time consuming. Sometimes the variety of wheat looks so similar that differentiating them becomes a very tedious task when carried out manually. To overcome this problem, Image processing can be used to classify wheat according to its quality.
This inspection approach based on image analysis and processing has found a variety of different applications in the food industry. Considerable research has highlighted its potential for the inspection and grading of wheat. Image processing has been successfully adopted for the quality analysis of rice, cereal grains, fruits and vegetables. Likewise wheat grain quality and characteristics have been examined by this technique. This paper presents the significant elements of the image processing technique coupled with a review on the research work carried out by various researchers in the field of quality information of wheat varieties.

S.V.More 2013(4) said that the Quality of grains is an important requirement to protect consumers from sub-standard products. Sensory pleasure, healthy eating, value and convenience the consumer trends are driving the food industry today. Rice delivers on all of these. Rice is the primary dietary staple for more than half the world’s population. It is the most popular grain globally, supplying energy, carbohydrates, protein, fiber, essential vitamins and minerals and beneficial antioxidants. In the last 30 years, rice consumption all over the world has more than doubled. Proposed system helps to identify the type of rice grain being provided.

III. PROPOSED WORK

According to our proposed method, first image of different wheat grains are acquired with a color Digital Camera. Here the wheat grains are dispersed on black background so that the image of grains can be separated from the background. Captured images are stored in JPG format. In MATLAB, captured image is read by the imread() function. The images acquired are color images, so it is converted into gray scale image. The color information is not necessary for further processing as it does not carry any useful information. Matlab function converts the color image to gray scale image by eliminating the hue and saturation information while retaining the luminance. Images are normally corrupted by noise during image acquisition process. Noise may get add to original image due to different factors. The noise interference in images might affect the results for some processing that worsen the quality of original image. Therefore, the image noise removing process should be performed on the image before applying preprocessing methods. Block diagram of the proposed system as shown below.

![Block Diagram](image)

The proposed system works on the steps shown in the block diagram. In the starting of the process first requirement of the input image of wheat. The required image will capture by the system and also stored in MATLAB. Under the second stage of preprocessing the noise will be removed from the input image and make it proper by adjusting necessary parameter. Sometimes in image there is a problem of brightness, contrast due to light effect. So under the preprocessing of image these types of problems will be minimizes by adjusting its grey level and threshold level of image. Then under the third stage of image segmentation, determining the exact quality of the input image by extracting the important features from the input image and finally on the basis of the important features of the input image, system will decide or identify the quality of the wheat. The result analysis will be generating by comparing its quality with available current data which stored already in database of the system. To implement “Quality Identification of Wheat by Using Image Processing”, we have to study about different grains and their different qualities. Also Study and survey of the wheat and different market rates as per the qualities of the grains. Also we have to study about different techniques of acquisition and types of seeds, and also take regarding information from merchants about how they are identifying the quality of the wheat and also studied the different subtypes of the wheat.

IV. CONCLUSION

Now a-days nature of grains is a vital prerequisite to shield shoppers from sub-standard items. Yield is the most detectable trademark to ranchers while the product is in the ground; however when the result of the product, the processed rice, achieves the business sector, quality turns into the key determinant of its deal capacity. Nature of a grain is an essential prerequisite throughout today's business sector, to shield customers from substandard items. There are such a large number of second rate quality grains landing to the market step by step. Today in rice exchange; rice of low quality is sold without being taken note. Be that as it may, there is no helpful strategy to distinguish these sub-par quality grains in the business sector. Consequently, this has turned into a significant issue for both the customer and the legislators. This anticipates will help in recognizable proof and arrangement of assortments of wheat using image processing.

V. REFERENCES

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