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Grain Condition Monitoring and Controlling System-A Review

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ABSTRACT: If we see the economy of India, everyone come to know that more than 40% population income depend on the agriculture. Some people is producing the agricultural product, others are buying that stuff and export that to another country or state where demand for that product is good or sell that to the local market as per the product value and quality. , now a day, there is no system that can capable of giving maximum quality output in less production time and cost. there is system that measure the quality of product as the testing is done by human, so it is not reliable at the all-time of its working hour because of the human limits. so we have developed the proposed system that can capable of giving the more reliable and efficient output of production for quality testing of agricultural products. This can work efficiently in his working hour without deflecting its efficiency. For the testing purpose we have selected the rice as the testing product and testing parameter are the whiteness, size, physical defect and color defect.

I. INTRODUCTION

A. Motivation

The agriculture in the country like India is vast there is grain are produce like rice, Bajara, Sugar, etc. so we have to control their quality for the packaging section in according to their size, color, weight. So for that we have developed the embedded solution with the help of image processing. Here we can estimate their quality using the simultaneously taking frame and applying the image processing algorithm for that frame and get result as the quality of the grains.

However, we can implement the same process for the all type of the grain only considering parameter are going to change so we can have the mode selection for the different type the grain. We can have the better result than the ordinary human eye. This work is going to be Product implement for the different packaging industries or quality testing department for the market Yard. Grain quality evaluation is done manually but it is relative, time consuming, may be varying results and costly. To overcome these limitations and shortcoming image processing techniques is the alternative solution can be used for grain quality analysis.

B. Objectives

In our project, we are going to research on the future requirement of the agricultural product quality of the grain for different purposes like export and quality assurance and as raw material of agricultural goods. Proposed system is designed to show all related aspect of the quality testing of the rice with respect to its size, whiteness, defect in physical and color. Show the graph of all parameter which mention earlier.

II. LITERATURE SURVEY

The reviews from different papers are taken and studied. some of them are given below.

Jyoti D. Bambole, et-al.[1] In this paper quality assessment of grain like rice depends mainly on its chalkiness percentage, breakage of grains, grain temperature, grain moisture content, insects infected, amylose contents gel consistency and size. In this detection and measurement of chalkiness percentage is done by LabVIEW software and also algorithm is developed and applied on the image to detect the chalkiness present in the rice grain.



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Qidi Zhao, et-al[2] This paper is designed for monitoring and controlling of grain condition based on embedded ARM9 core processor, using SCM. The paper focused on principal of the multi-regional weighted fusion and hardware circuit design. This paper has good features such as good site stability, easy acquisition and real time on-line detection.

Bhagyashree Mahale, et-al[3] The paper presents a solution of grading and evolution of rice grains on the basis of grain size and shape by using edge detection algorithm in image processing techniques. That algorithm is used to find out the region of boundaries of each grain. In this technique rice is used as a grain & find out the boundaries of rice grain and measured its length and breadth. This method requires less time and low cost.

Ece Olcay Guines, et-al[4] This paper based on image processing techniques to classify wheat seeds based on their varieties. Paper is Proposed to identify the Wheat varieties grown in Turkey by using image analysis techniques, with the motivation of developing a fully automatic grain type and variety identification system. The Proposed method is based on texture analysis and k-Nearest Neighbor type classifier.

Vinay Sambhaji Suryawanshi, et-al[5] This paper is developed to real time monitoring and controlling system for food grain storage. The overall structure of the proposed grain storage system consists of two components, one is the host computer located in control room for information processing and prediction of grain situation, the other is the lower computer terminal in granary with grain data acquisition. Acquired data from different sensors and transmitted over Ethernet is the main purpose of this system.

Vinita Shah, Kavindra Jain, et-al [6] The proposed method for quality assessment of INDIAN KAMOD ORYZA SATIVA SSPINDICA (Krishna Kamod Rice) using image processing and multi-layer feed forward neural network technique which achieves high degree of quality than human vision inspection. The proposed algorithm based on morphological features is developed for counting the number of Krishna Kamod rice seeds with long seeds as well as small seeds. A trained multi-layer feed forward neural network based classifier is developed for identification of unknown rice seed quality.

Chetna V. Maheshwari, Kavindra R. Jain et-al [7] In this paper basic problem of rice industry for quality assessment is defined which is traditionally done manually by human inspector. Machine vision provides one alternative for an automated, nondestructive and cost-effective technique. With the help of proposed method for solution of quality assessment via computer vision, image analysis and processing there is a high degree of quality achieved as compared to human vision inspection. This paper proposes a new method for counting the number of Oryza sativa L (rice seeds) with long seeds as well as small seeds using image processing with a high degree of quality and then quantifies the same for the rice seeds based on combined measurements.

Duan Liying, Zhang Genshan, Liu Xuning, Shi Wei, et-al [8] The paper presents the necessary software and hardware detection device platform, carried out research on the segmentation and counting algorithms of particle images for the system, and designed and implemented image processing techniques based on particle quality grain seed of the determination system. The result of the research has broad application prospects.

HAN Zhong-zhi; LI Yan-zhao, et-al [9] In this paper the testing aiming at 1400 grains is made separately in unsound kernel, mildewing, impurity, hetero-variety and other aspects with the result of the correct rate of the comprehensive testing reaching 95.6%. According to the national standard, the method of gradetesting on peanut kernels' specification and quality is designed, with which 100 grains of peanut are testing resulting with the result of the correct rate of the comprehensive testing reaching 92%. Using the method related in this article to test the appearance quality and distinguish the grade of specification can reach high correct rate which must produce positive significance to the peanut's production and the industry's development.

Zhao Ping; LI Yongkui, et-al [10] Paper presents that the Grain counting is very important for breeding and quality inspection. In order to improve the efficiency and precision of grain counting, a novel method based on MATLAB image processing technology and mechanical vibration technology was proposed It can effectively resolve the overlaps



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and conglutinations among grains by mechanical vibration and image erosion processing respectively. Experiment results show that this method is Convenient, efficient and high-precision. At the same time, it establishes necessarily theoretical and practical basis for further studies, and may be important to perfect “precision agriculture”.

III. CONCLUSION

In this study, it can be concluded that the use of image processing algorithm is an efficient method to analyze grains quality by its size. The main benefit of is it requires minimum time; cost is less and gives better results compared with manual results or traditional methods. The primary need of our paper is to monitor and control the quality of grain using Raspberry -Pi development board and Python platform using open CV image processing package. Based on the survey, we have been able to use Quality assessment of grains which depends mainly on its chalkiness percentage, breakage of grains, grain temperature, grain moisture content, insects infected, amylose content, gel consistency and size.

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