

Rice Grading Quality Analysis for Agmark Standards

^{#1}Prof. V.B.Raskar, ^{#2}Swapnil Thorat, ^{#3}Praviin Mane, ^{#4}Eeshwar Tak

²svthorat2312@gmail.com

³pbmane25@gmail.com

⁴eeshwartak143@gmail.com

^{#1}Prof. Department of Electronics and Telecommunication

^{#2,3,4}Department of Electronics and Telecommunication

JSPM's Imperial College Of Engineering & Research, Wagholi, Pune.



ABSTRACT

The quality food grain we consume is of more important, as people are now educated and they demand for quality of grains. There is possibility of fails of food grains by the traders. The quality assessment is going on visual inspection which is manual process. In this work we have to use image processing technique an attempt to automate the process which overcomes the drawbacks of manual process. This paper provides the quality of rice grains based on its size. Here we use the different varieties of rice grains for testing. The system is developed using set of images and are classified using decision tree based classification technique. The results are found to be encouraging.

Keywords : AGMARK, Binarization, Grayscale , MATLAB, Region Props.

ARTICLE INFO

Article History

Received :13th March 2016

Received in revised form :

15th March 2016

Accepted : 18th March 2016

Published online :

21st March 2016

I. INTRODUCTION

The quality inspection method of rice grain which is followed by Agmark is based on manual inspection by the assigned inspectors which proves to be an improper way and outcomes that results are inaccurate. A digital inspection method for Agmark Standards for quality assessment of rice is required. So this paper proposes a digital method which can be used to evaluate the quality of rice for the present Agmark Standards. The proposed method is formulated with the help of digital image processing technique on MATLAB. In this paper three parameters; Broken Grain , Foreign Particle and Admixture of Agmark Standards are converted to digital form for digital quality inspection of rice. The outcomes of inspection of the samples studied, showed that our model was an effective way for digital inspection of Agmark Standards.

Rice is the most important and widely grown food crop in the world..It is the staple food of more than 65 percent of the world population .Rice is mainly produced and consumed in the Asian region. India has the largest area under rice in the world and ranks second in the production after china. It has also emerged as a major rice consumer. Rice is primarily a high energy calorie food. The major content of rice consists of carbohydrate in the form of starch, which is about 72-75 percent of the total grain

composition. In India to overcome the need of ever-increasing population it is necessary to make advancement in agricultural sector. Due to automation need of high quality and safety standards achieved with accurate, fast and cost effective quality determination of agricultural goods. Quality check is of great importance in the Grain industry because after harvesting, based on quality parameter a grain product has been sorted and graded according to the standards. AGMARK is a set of Standard Guidelines establish by Food & Drug Department where by all food products which are listed under Agmark Division should comply with the benchmarks stated for their production & packaging etc. Agmark is an acronym for Agricultural Marketing. This organization used to approve the food products for their quality. This has been dominated by other quality standards including the non manufacturing standard ISO 9000. Food and Drug Administration FDA also approves certain quality standards for food items.

The demand for quality of food products we consume is increasing day by day. As the literacy rate is increasing in India so is the need for quality of food products is increasing. India is the second largest producer of rice grains first being China. As the production of rice is increasing so is the demand for its quality. This demand for quality of food grains is increasing because some of the traders cheat the shopkeepers by selling poor quality food grains which

contains foreign particles like stones, sand, leaf, broken and damaged seeds etc. This kind of low quality of rice is sold without being noticed even and moreover there is no special scheme to find such poor quality grains. Therefore it is been a problem for both consumers and sellers. As the technology is growing wider people are adopting the new technologies rather than using the old techniques. The growth in technology is making people more demanding towards the things they use and consume, this is the reason why everything is becoming automated. The use of Image processing techniques for testing the quality of rice grains is inexpensive and is less time consuming. The quality of grain is tested based on its color, size, shape and texture features in this method. Further, biological methods (DNA technique etc) and chemical methods (alkaline tests etc) can be used for the identification of rice grain seed varieties and quality. But these methods are very expensive and time consuming. On the other hand the machine vision or the digital image processing is a non destructive method (i. e. after assessment the grains can be used), it is a very fast and inexpensive process compared to the biological methods.

II. PROPOSED SYSTEM

In this proposed system we have to optimize Quality control and this is the most important factor for any manufacturing industries. Since the defect detection methods are slow, subjected to errors and time consuming, most of the industries now opt for automatic inspection systems. We also the increasing production speed and high labor charges also paved way for the fast existence of this new trend. Increased expectation of high quality products from customers made the industries more responsible. As a solution to these problems, artificial vision based automatic inspection systems arrived. The machine vision, or computer vision, has been growing at a fast pace. As in most fast-developing fields, not all aspects of machine vision that are of interest to active researchers are useful to the designers and users of a vision system for a specific application.

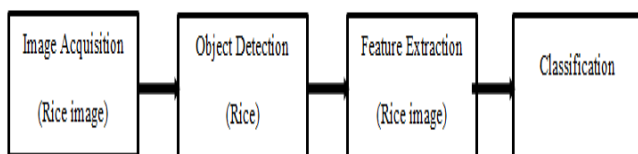


Fig 1. Computer vision system

Image Processing is used in agricultural research with the improvement of Digital technology and significant reduction of the cost of hardware and software of digital imaging. The objective of this propose system is to propose a Machine Vision System for AGMARK which is easy to identify the grains and foreign according to their Area, Perimeter and Length from the rice sample images.

Algorithm:

Input:

Rice sample input image.

Output:

Classified grain quality grade.

Steps of algorithm:

Step1: Pre-process the images of rice to remove background noise

Step2: Convert the pre processed image to binary image using Otsu method.

Step3: Region label the binary image.

Step4: Segment/crop the individual grains present in the image.

Step5: Extract the geometric features major axis, minor axis and area of all the individual grains.

Step6: Perform analysis on the quality using the average values of the features extracted.

Step7: Classify the sample for the Type and grade based on the analysis.

Step8: Stop

Methodology:

1. Take a high quality image of basmati rice sample with the help of high quality camera \ scanner. A black sheet was used which gives the black background to the image which helps in parameter extraction from the image.

2. Input the image into the system. The interface between the Camera/scanner and PC is provided through USB Cable.

3. Now convert the High Quality Image into Grayscale Image. Show in fig. 2.



Fig 2. Gray Image

4. Image was pre processed by removing the background and adjusting the contrast of the image showing fig 3. Most of these operations compute result based on weighted sum of a pixel value and its neighbors values.



Fig 3. Contrast Image

5. The binarization process converts the grayscale image into two values 0 and 1. In general, these values are zero and the maximum value in the image.



Fig 4. Binarization Process

6. Values of various Morphological parameters of sample grain are extracted with the help of Region Props.

7. Repeat above steps for different samples.

III.CONCLUSION

A digital system for Agmark Standardization of Rice has been proposed on the basis of machine vision. We used Image Processing Toolbox of MATLAB for grading of rice grains. The paper illustrates a new method, which is non-destructive for quality evaluation. With proper use of commands and tools, we can design a low cost detector which helps in extracting the morphological features of grains like area, perimeter and length etc of an object.

REFERENCE

[1]. R.Kiruthika, S.Muruganand , Azha Periasamy "MATCHING OF DIFFERENT RICE GRAINS USING DIGITAL IMAGE PROCESSING" International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering Vol. 2, Issue 7, July 2013

[2]. B.K. Yadav, V.K. Jindal "Monitoring milling quality of rice by image analysis" Computers and Electronics in Agriculture 33 (2001) 19-33
www.elsevier.com/locate/compag

[3]. XuLizhang , Li Yaoming, Multi-Scale Edge Detection of Rice Internal Damage Based on Computer Vision, Proceedings of the IEEE International Conference on Automation and Logistics Qingdao, China September 2008

[4]. YangYiShan ChenLiYun, XuYaoWu. From rice quality evaluation criteria of change to see our rice breeding for quality development [J].Journal of hybrid rice, finance (ciic 3) : 5-10.

[5]. Bhavesh B. Prajapati¹, Sachin Patel² "Algorithmic Approach to Quality Analysis of Indian Basmati Rice Using Digital Image Processing" International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 3, Issue 3, March 2013)

[6]. Yao, Chen, Guan, "Inspection of rice appearance quality using machine vision", Global Congress on Intelligent system, 2009 IEEE

[7]. R. M. Carter, PhD Thesis: On-Line measurement of size distribution and volumetric concentration of pneumatically conveyed solids using digital imaging techniques. 2005, University of Kent, UK.

[8]. R M Carter, Y. Yan., Measurement of particle shape using digital imaging techniques. Journal of Physics Conference Series, V. 15, pp. 177-182, 2005.

[9]. Rohit R. Parmar, Kavindra R.Jain, Dr.Chintan K.Modi, "Image Morphological operation based quality analysis of coriander seed (Coriandrum sativum L.)," ETNCC (International Conference on Emerging Trends in Network and Computer Communications), 2011.

[10]. Gonzalez, R.C., Woods, R.E., 2008. Digital Image Processing. Prentice-Hall, Upper Saddle River.

[11]. Zhang, G., Jayas D. S., White N. D.G., 2005. Separation of touching grain kernels in an image by ellipse fitting algorithm. Biosyst. Eng., 92(2):135-142.