Image Processing for Grain Detection

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Abstract
In the present grain-identification and detection system type of grain and grain quality are identified manually by visual inspection which is difficult and not accurate. In this paper we are focusing about the methods used for detection of grain. An machine vision system is introduced which is used for grain type identification and differentiate different type of grains based on special features (color,geometrical) as attributes for classification. The grading of rice sample is done according to the size ,shape and texture of the grain .A good classification accuracy is achieved using only 6 features, i.e. mean of RGB colors and 3 geometrical features. Also image Pre-processing, Feature extraction, Image Acquisition, Filtering, Morphological operation and segmentation are going to be perform to differentiate the grain

[**Grain Type Identification, Detection, Image Processing**]

Problem Statement
An machine vision system is introduced which is used for grain type identification and differentiate different type of grains based on special features.

Market/Business needs Assessment
Agriculture is the largest economic sector and it plays the major role in economic development of India. In the manual grain differentiation and grading techniques which are being used to distinguish between different types of grains are completely relying on human efforts, they are subject to some kind of errors. So as to reduce the human efforts and errors we can take help of automated system which also
helps to reduce the time cons. I hope to create a service that can solve the problem of the fishing industry and help to increase their revenue

The new agricultural technologies are being developed by researchers that creates a questions about the time efficiency and quality effectiveness. Which I am going to solve in this project.

Target Specification
Manually gradation of grains is tough and time consuming some times farmer gets benefit some times it is not .so the AI and ML is work together and solve the problem.

External Search
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Benchmarking

I am not found the idea is implemented but research papers are published in rice qulity detection ,pattern of rice grains.

Applicable patents

Quality of grains is an important requirement to protect consumers from substandard 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.

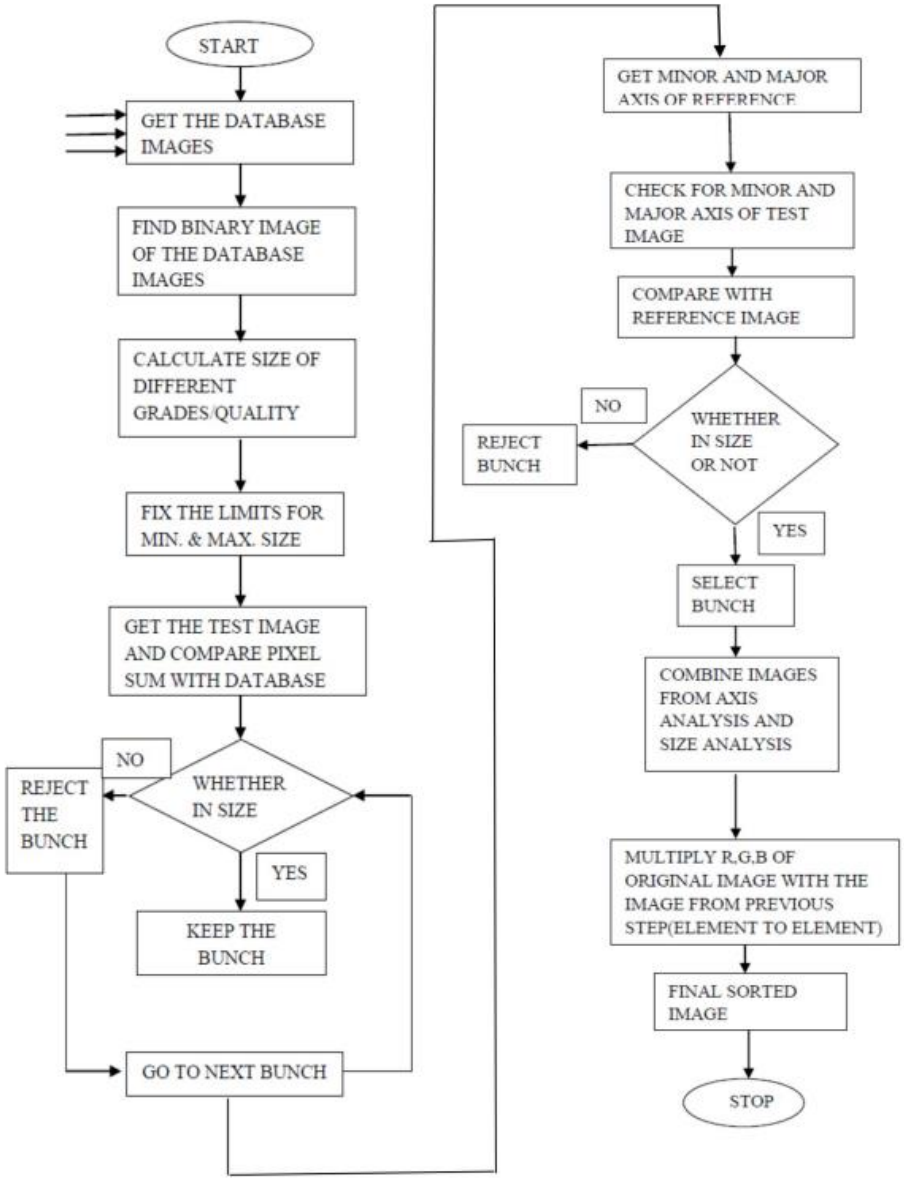
Sometimes it becomes very hard to differentiate between the same color and shape of grain. To overcome this
problem, Image processing can be used to classify wheat according to its quality

- IMAGE ACQUISITION:
  The first stage in any machine vision system is to acquire digital image. Image acquisition does this job. This can be done by sensor, digitizer or digital camera. After the image has been obtained, various methods of processing can be applied to the image to perform the many different vision tasks .
- IMAGE PRE-PROCESSING:
  Pre-processing is one of the important steps for the enhancement of quality of the captured image. It uses small neighborhood of pixel of an image to get new brightness value in the output image.
- IMAGE FILTERING:
  It helps to transform pixel intensity value to reveal certain image characteristics.

- Enhancement: Improves contrast.
- Smoothing: Remove noises.
- Gaussian Filter: Gaussian smoothing is very effective for removing Gaussian noise

Applicable constrains

- Data collection of all type of grain
- Train the heavy model
- Clear pictures required
- Depth knowledge persons required
- Tones of data requires to fit the good model
- mage clarity:- While taking the image as input blur image causes error in output
- Impurities :- Impurities such as stone , worms present in the grain causes error, it is difficult for detection .
- MAGE SEGMENTATION:
  It is used to perform segmentation using component labeling i.e. once the image is binarized it will perform labeling of connected components. Assigning label to every pixel in image i.e. pixel with same label shares the certain characteristics.
- FEATURE EXTRACTION:
  In this process some qualitative information is being extracted from the objects to be analyzed in the image. The various features that could be extracted are color features, geometrical features and texture features. In this method we have extracted 3 color features and 3 geometrical features.
- COLOR FEATURES:
  Color features is very important in the classification process. We are going to use the extracted features of color which are red, green and blue i.e.RGB.



CONCLUSION

The main purpose of this project is to provide better approach for identification & detection of grains. Here all measurement are stored in variable 'Grain size' and each measurement direction separately in its own corresponding variable. Variable 'Grain size' probability levels includes the grain size at different probability level and the average grain size is output into variable average grain size. The relative grain size dispersion is sorted in variable.

Also, it is fast, less memory consumable and cost effective. In the up gradation of this method, a grading of grains can be done on the basis of grain size.