**Abstract**

We are making a software, which determine the length, width and quality of a rice grain. This software is for the seed to classify as “good/certified “or “bad”. It must be able to pass a grain certification standard that determines whether the grain is true to varietal type. Dataset of rice is collected and different image processing functions are applied to extract information from each rice grain in every image. The user get the rice quality and age in result and verify from original standards.

**Introduction**

We are making a software, which determine the length, width and quality of a rice grain. This software is for the seed to classify as “good/certified “or “bad”. It must be able to pass a grain certification standard that determines whether the grain is true to varietal type.This system will differentiate the grain from the image, straighten them up one by one, and then give length, width, maximum intensity, minimum intensity value of that grain and check that the grain standard. Then we store that info in a specific place.

**Methodology**

**Acquisition**

Images were acquired by setting a black piece of cloth at bottom of a shoe box .On cloth piece a 5 rupee coin and cap of Coca Cola bottle and few rice were placed randomly. The box was closed and through a small whole on top of the box pictures were captured. Almost 70-75 pictures were captured with same method but coin and bottle cap positions remained the same.

**Processing**

First image will read .then apply thresholding on image. Then the program will find label and apply regionprops on that image to properties. After that each rice grain will be detected by using eccentricity and area, we apply then bounding box and plot that box by using making line between x and y axis. Now bounding box is applied on each rice grain according to its area. Each bounding box is cropped to get separate image of each rice. Then we get angle of that grain by x and y axis, convert the angle into degrees the image angle will be 0, then add 90 to it to rotate image to 90 degree. Then apply function that will produce length, width, minimum intensity, maximum intensity and mean intensity value of final cropped 90 degree image. These info will store to an excel file.

**Libraries** use for this project.

* XLSWriter for manipulation in a excel file.
* Math To convert orientation value from radians to degrees
* Skimage.Transform To rotate pictures
* Glob To read image files one by one up to end of file
* Matplotlib To show and plot images.
* Region Props To find (angle of orientation, intensity of image, area , eccentricity and bounding box)

**Results**

Result will be the length, width, and their min, max and mean intensity and will store in excel file. Other image is one the image of a rice grain stored in another folder. This image is the one which was rotated to 90 degree.

**References**

http://scikit-image.org/docs/0.12.x/auto\_examples/segmentation/plot\_threshold\_adaptive.html

http://scikit-image.org/docs/dev/api/skimage.measure.html

<http://xlsxwriter.readthedocs.io/example_demo.html#ex-demo>

https://stackoverflow.com/questions/31735499/calculate-angle-clockwise-between-two-points

<http://xlsxwriter.readthedocs.io/>