Rice Seed Classification Presentation
A short synopsis of Lab 4

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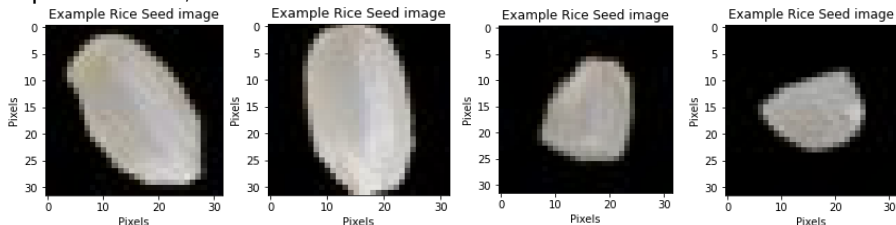
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Abstract

This experiment was aimed at systematically classifying rice seed images as either:

- Broken
- Proper

Our experiment was successful in that we were able to construct a classifier that could take an input image or images, such as the ones depicted below, and return a classification.
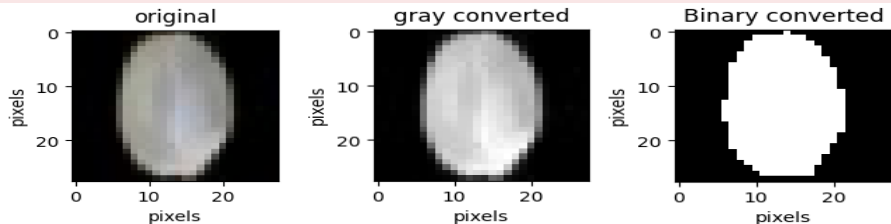
Procedure

Using python code, we:

1. Read in our dataset of images

2. Converted each individual image to grayscale and then to a binary black and white image

3. Calculated the area of each respective rice seed

4. Plotted each area on a scatter plot in order to set an area threshold for classification

5. Tested our threshold on a testing set to ensure accuracy

6. Created a function using the above procedure which could return a classification
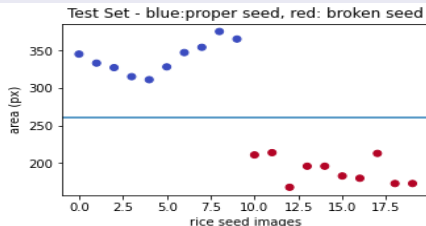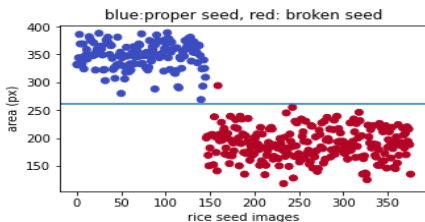
Final function call

$$prediction = manualClassifier(image, areaThreshold) \tag{1}$$

Examples

Step by step image transformation for area calculation


Scatter plot of train and test areas

Conclusion

From this experiment, we were able to construct a thorough procedure for classification and then we were able to utilize the learnings from this procedure in order to build out a function for classification. Having a function like this allows us to quickly and efficiently produce classifications such as the one below:


```
correct label is:    proper
predicted label is:    proper
```
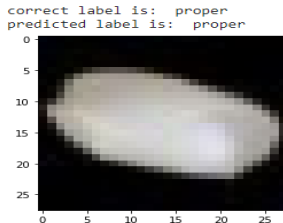
Our final classifier was very accurate for our dataset, however, room for improvement exists. In future classifications, it may be valuable to include other metrics besides just an area threshold. This would allow us to classify images which are disproportional large however may still be broken rice seeds.