MACHINE LEARNING TEAM: WEEK 3 PLAN

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Last week the three of us researched different ways to process, cluster, threshold, and contour images. We have a general flow chart on the next page outlining the whole process. We have come up with several options for thresholding and image processing that we believe offer great improvement over the methods used by the previous group. We should be able to test all of these techniques by the end of next week.

The first general problem that we are faced with in this project is thresholding images. We need to isolate the droplet shapes in the image in order to perform machine learning analysis on the images. The validity of our machine learning methods is dependent upon how much information our thresholding and contouring methods obtain.

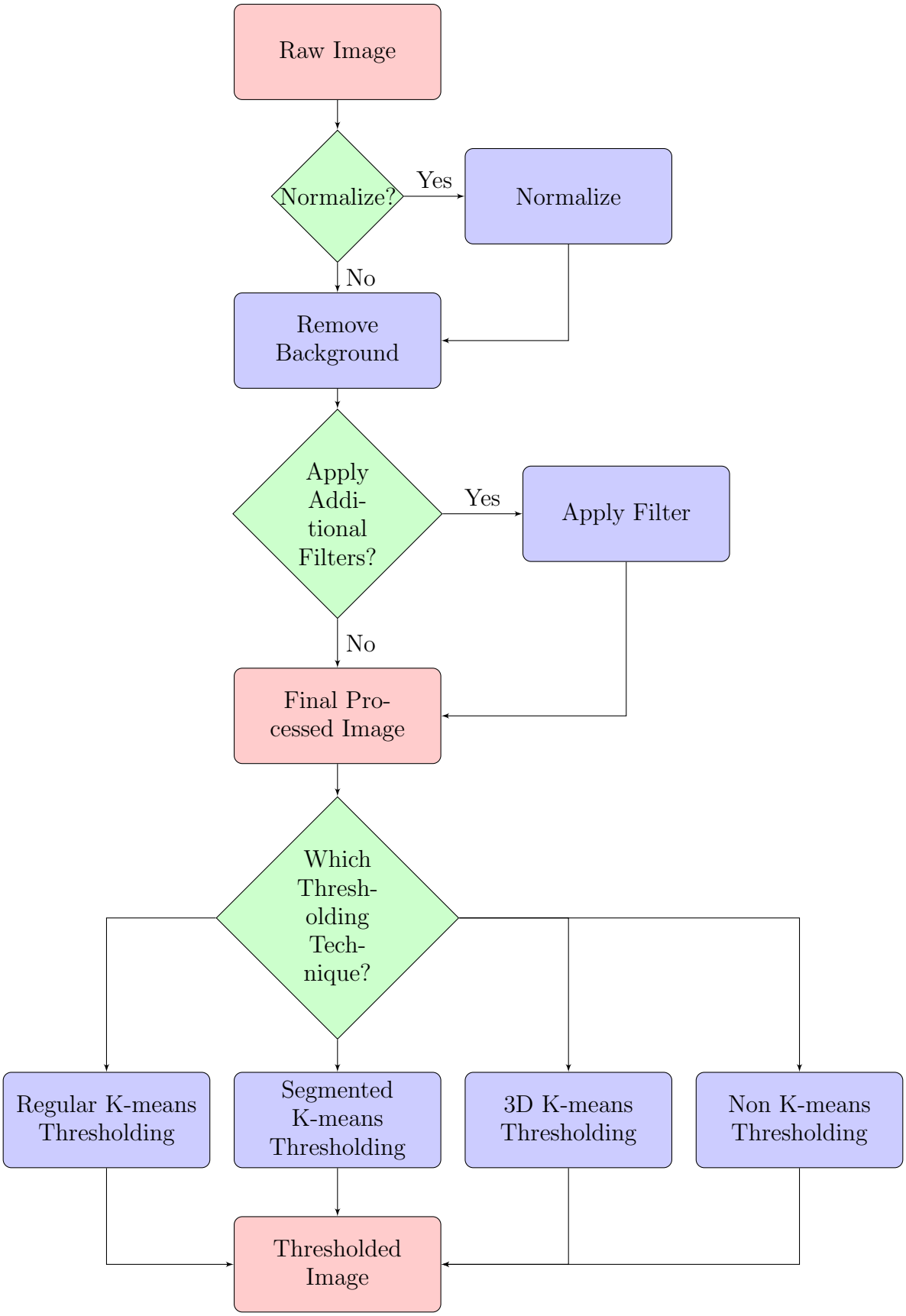
The methods we will try for thresholding are listed below:

Thresholding:

- k-means
- Segmented k-means (segmenting the images and performing k-means)
- 3D k-means (k-means applied to color and position information)
- High k k-means (Applying very large k values for better thresholding)
- Additional methods

We are also going to see if performing thresholding analysis on images within the 16-bit encoding, as opposed to the 8-bit encoding used in the normalized images. We will also be researching and applying other methods besides k-means to cluster and threshold the data. Furthermore, we have found some new image preprocessing methods that increase contrast within the images. These methods are easy to implement and may improve the performance of our thresholding.

Date: October 14, 2019.


Raw Image
Normalize?
Yes
Normalize
No
Remove Background
Apply Addi-tional Filters?
Yes
Apply Filter
No
Final Pro-cessed Image
Which Thresh-olding Tech-nique?
Regular K-means Thresholding
Segmented K-means Thresholding
3D K-means Thresholding
Non K-means Thresholding
Thresholded Image