Journal Report 2
9/8/19-9/15/19
Aimee Feng
Computer Systems Research Lab
Period 1, White

Daily Log

Monday, September 9

Created method to determine gradient at each pixel in 5-dimension space.
Researched watershed segmentation algorithm variations.
Compared Meyer's flooding algorithm to SLIC segmentation.

Tuesday, September 10

Coded my own version of the SLIC segmentation using k-means based on the SLIC Superpixels research paper by Achanta et al.
Program groups pixels in image into 300 superpixel groups based on proximity in distance and LAB color.
Attempted printing image with boundaries of superpixels outlined in black.
Printed image with superpixel groups all set to average color of group.

Thursday, September 12

Optimized SLIC segementation code. Cut run time down from 10 minutes to 3 minutes for 300 superpixel groups in image by implementing optimization methods for k-means.

Timeline

Date	Goal	Met
September 1	N/A	N/A
September 8	Research SLIC algorithm and create program to segment images	Yes, but current implementation uses a pre-built library
September 15	Create program implementing SLIC without using SLIC method from pre-built library	Yes, but current implementation is much slower than the pre-built library
September 22	Identify 60% of superpixels that are shadows in the image	
September 29	Identify 85% of superpixels that are shadows in the image	

Reflection

I created my own implementation of the SLIC superpixel algorithm with k-means. Compared to the skimage library implementation, mine is extremely, extremely slow. In my attempts to code and optimize k-means this week, I have been unable to try and incorporate watershed segmentation somehow with SLIC. At the moment, I will return to focus on my project and start trying to identify shadow regions with the leave-one-kernel out method.

I may have to adjust my identification accuracy goal, as I have yet to look at the specific details of shadow identification. It's possible that if the algorithm requires more complicated math I will need more than a week to implement a basic shadow identification program.

If time permits, I may return to investigate ways to improve my implementation of superpixel segmentation sometime in the future.