

Daily Log

Tuesday, October 15

Researched object shape identification in images. I don't think I will be using the COCO neural network, because I don't need to identify what an actual object is, I just need to identify the shapes of objects in the image.

Wednesday, October 16

Attempted using Canny Edge detection to separate boundaries of objects, but there was trouble differentiating at small segments along the borders of an object and its shadow in pictures with very dark shadow-object boundary. Tried using drawContours from OpenCV library, but that separated regions by color rather than by object.

Thursday, October 17

Trained a basic neural network to identify some objects with COCO dataset, but then I realized that the neural network I trained doesn't give me boundaries of the actual objects, so it's not actually useful in helping solve my problem. Went back to my mean-shift image that combined a shadow and its object together and tried to find ways to relate the two together from there.

Tuesday, October 22

Created a logistic function to run LAB color values through to rescale them. Played around with what section of the curve to count as a shadow.

Thursday, October 24

Tried different constants with the logistic function. Currently set 'carrying capacity' to 255, and the logistic growth constant to be .05, but may change later depending on results from a larger image testing data set.

Timeline

Date	Goal	Met
October 6	Train a functioning LSSVM or SVM classifier	No. But my new method of identifying shadow regions no longer require using an LSSVM or SVM classifier.
October 13	Identify 90% of shadow superpixels/regions in image	Yes. Every superpixel where a majority of pixels inside are shadow pixels is counted as a shadow region as a whole.
October 27	Associate each shadow with respective object for images with one object	No. I went back to focusing on improving my identification of shadow pixels and regions with the logistic growth curve.
November 3	Associate shadow with respective object for images with one object	
November 10	Associate shadow with respective object for images with one object	

Reflection

Getting the shadows to be associated with the objects is harder than I expected. I run into a lot of the same problems that other research papers discussed, like the light reflections on shinier surfaces. Originally, I was thinking about using UV mappings to compare object and shadow images to see if they line up. I would prefer not using this method, because the math is really complex and it would make the program extremely slow to run through all the possible projections of object to shadow. Also, it would require the shadow region identification and object region identification to be very accurate, and my current methods, though give fairly good results, aren't detailed enough to work with a UV mapping.

I'm considering using the criteria of if shadows and objects touch each other, then associate them together. But this won't be enough, so I might also look for unique features to identify them like comparing the 'outermost' points of each boundary. There's going to be trouble when there is more than one shadow in the image, especially if they overlap one another. I will have to do more research when I get there.