

## Daily Log

### Monday, November 18

Researched various object identification techniques that would help with associating objects and shadows.

### Tuesday, November 19

Implemented object detection with imageai library. First used a yolo-tiny trained neural network, then used a COCO trained neural network to identify objects.

### Thursday, November 21

Implemented object detection using the CVGrabCut() method from the opencv library to separate the foreground and background. Doesn't always identify objects, as it just separates what appears closer and what appears further away in the image. Implemented object detection using the CVLib library.

## Timeline

Date	Goal	Met
November 10	Associate shadow with respective object for images with one object	No. I tried with the mean-shift segmentation, but the results vary too much based on the image. Some are successful, and some aren't.
November 17	Implement a feature-based shadow detection and a region-based shadow detection.	Yes. The feature-based detection used gradients of object outlines, which I combined with a previous kmeans implementation, which I then also combined with a color model analysis.
November 24	Determine the most accurate shadow detection method	Yes. I've decided to stick with the LAB analysis paired with a log function, and started working towards identifying objects in images.
December 1	Identify all objects with shadows in the image	
December 7	Pair shadows and respective objects together	
Winter break goal	Associate objects with their shadows on the image	

## Reflection

The LAB color analysis with logarithmic function works fairly well, but I may keep having to tweak values as I keep going. A big problem I find with object detection techniques right now is that a bound box is given for identified objects, not the exact pixels where the object exists, and oftentimes, the neural network can't identify the object if it's not one of 80 common objects. This is especially true of the implementations of imageai, as they can't recognize the sign in image '001.jpg.'

The CVLib has identifies more objects than the imageai implementation, but again doesn't identify objects with shadows if the neural network can't classify the object. I may look towards investigating the CVGrabCut() method more, because if it identifies a region as a foreground, the object and shadow would both be grouped together, and I could 'subtract' the shadow pixels to find the object pixels.