Daily Log

Monday February 24

Out sick.

Tuesday February 25

Scrapped extended orthophoto idea. Tried implementing CLAHE, as Kevin Chung has in board detection, to up the contrast for better orthophoto results. Found his parameters don't work well for rounder shapes, nor do they work on color images.

Thursday February 27

Successfully implemented CLAHE on color image input by converting the color space from BGR to LAB, then running CLAHE on the L channel. This produces a much better orthophoto. Began relabelling training data.

Timeline

Date	Goal	Met
Feb 10	Fix chess-logic implementation, label new images, then return to Feb 3rd goal	Done, not returning
Feb 17	Finish slanted square segmentation, return to piece labelling	Done
Feb 24	Finalize orthophoto tweaks, begin piece labelling (March 6th)	Done
Mar 2	Finish piece labelling, train new model for States (March 6th)	Not started
Mar 9	Test and integrate new model for States (March 6th)	Not started

Reflection

I increased the accuracy of the orthophoto empty/non-empty guesses, particularly with black pieces on dark squares, by bumping the contrast of the original image up, which produced a better Canny image. It took me a while to figure out how to apply Contrast-Limited Adaptive Histogram Equalization, or CLAHE, to a color image, as my partner only applies it to grayscale images for board detection. However, I eventually stumbled on a Stack Overflow thread where someone converted an image to the LAB color space, and applied CLAHE to the L, or luminosity, channel. This increased the contrast in the brightness while largely preserving the color.

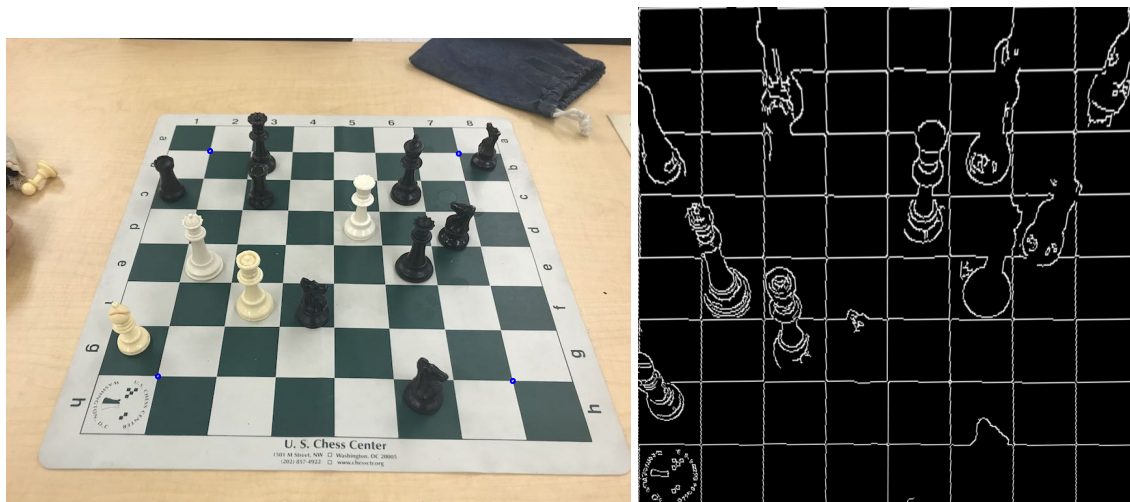Note the black rook on c3 and black knight on h6 in the images below:

Figure 1: Before

I also began relabelling my dataset, which I need to do because I'm now shearing every chess piece to normal, and I trained my original CNN on unsheared pieces. However, Kevin Chung decided he could modify his final UI slightly to help with data labelling, so I'm planning to wait for him to implement that before I continue labelling.
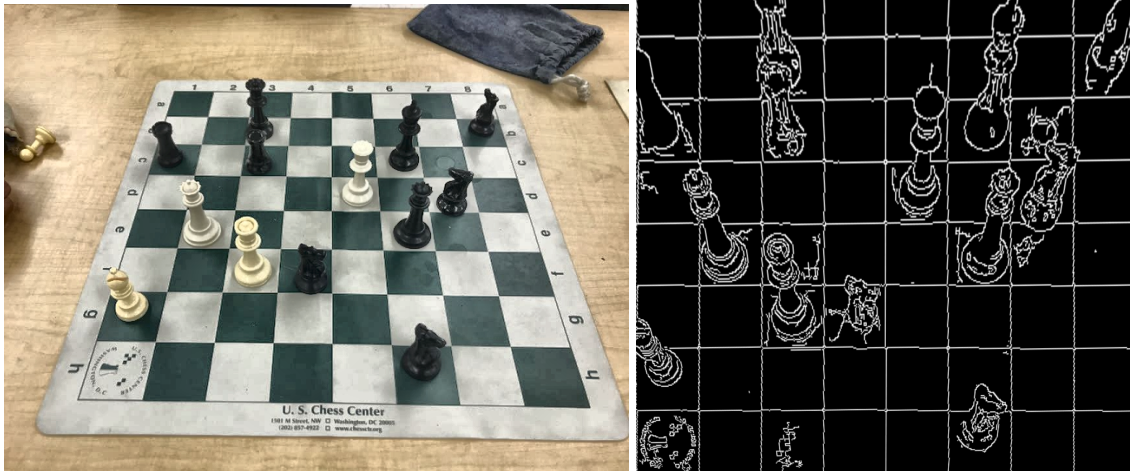
Figure 2: After

1 Year-End Goal Statement

Grade	Research	UI	GitHub	Final Paper	TJStar
A	Have meaningful research on transfer learning with ResNet, data augmentation and pre-processing, and computer vision to mitigate the effect of occlusion on image classification.	Functional UI that allows user to track chess moves in a video or get the board state of a still image.	Detailed, allows user to run UI.	Detailed.	Strong presentation.
B	Have meaningful research on transfer learning with ResNet, data augmentation and pre-processing, and computer vision to mitigate the effect of occlusion on image classification.	No functional UI.	Detailed, allows user to see backend.	Detailed.	Strong presentation.
C	Attempted research on computer vision, image classification with ResNet.	Attempted to write program that tracks chess moves.	Repo exists.	Written.	Presented.