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Period 5

Journal 7

This week I was more focused on maintenance. I fixed a bug that was causing several runtime warnings during the line linking stage of the straight line detector. Additionally, I rearranged some functions into different scripts to clean up my code. Kevin Fu looked through my code and found some duplicate functions that I also cleaned up. I also started the groundwork for lattice point detection, or detection of the intersection on the chessboard.

As for the actual board detection, I made a slight improvement to the board detection by first separating the lines in horizontal and vertical lines. If the line was diagonal, I put it in horizontal if theta was between 𝝅/4 and 3𝝅/4. Otherwise, I labeled the line as horizontal. Instead of taking all combinations of four lines as possible board boundaries, I took combinations of two vertical lines and two horizontal lines. It resulted in a small time improvement, but the board detection is still too slow to actually be useful.

I also read up on lattice point detection to try and understand the rest of the algorithm. Basically, the program looks at all the intersections between the detected lines and considers them as potential lattice points. It then takes a 21x21 slice centered at the intersection and processes it using Otsu’s algorithm and Canny edge detection. Afterwards, it uses a simple CNN to classify whether or not the image is a valid lattice point. After it finds all the lattice points, it tries to fit a board to the detected points using a method detailed in Czyzewski et al.