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COSI 159A - Computer Vision

Task 1:

The major problem with my code is the runtime. Though I can parallelize my code to improve its performance, the runtime is substantially longer with the time needed to run one iteration of one row of an average banner-sized image to take potential hours. Compared to the Scikit and other implementations that require far less time. Due to this runtime issue, I needed to resize my test images around 1% to 5% of the original size to be able to process one image in a reasonable time.

In addition to this, my code also tries to preserve the number of centroids whereas the Scikit implementation manages to remove centers that overlap or mix. This results in the Scikit implementation having much cleaner and better superpixels that generalize the images better. My implementation faces the problem of “highly detailed” regions. In the campus image I used, my SLIC result clearly still shows the window details of the buildings as superpixels with large numbers of ‘panhandles’ congregating at the building’s face due to its variety of details. Whereas the Scikit SLIC manages to generalize items into nearby superpixels.

My implementation of SLIC also seems to not be as accurate and may require further tuning as the results are not as clean. The superpixels do delineate reasonable regions of interest but do not have the clear separation of parts as seen in the Scikit implementation.