

---

## Our progress so far

Up to this weekend (Nov 17), we have been strictly following the schedule we planned. During the week of Nov 5, we have completed the sequential version of the canny edge detection algorithm and done some basic profiling. We evaluated the quality of our sequential program by plotting the edge graphs of about ten pictures with different features (symmetrical, complicated, those with faint borders, etc.), and were generally satisfied with the results. During the week of Nov 12, we parallelized the Gaussian filter and the non-maximum suppression with CUDA. Up till now, we have largely finished the parallelized version of Canny edge detection, but not image segmentation. Our final goal is to employ edge linking to connect the edges into contours, so that we can achieve reasonable image segmentation. This would be our goal for the next two weeks.

In the project proposal, we set the baseline goal to be achieving image segmentation by linking edges to constitute closed-boundary contours. Since we have not yet started on the most challenging part — edge linking, we can't say much about it now. However, we have formalized some ideas about the details of implementation and parallelization methods. We believe we will be able to produce this goal within the next two weeks. In the project proposal, we also set the “nice to have” goal to be exploring various applications of image segmentation, such as object cutout, and even object detection. Since we are strictly following the planned schedule, we might only leave one week for exploration. If that is the case, object detection might be too large an ambition. We are now planning to achieve object cutout, i.e. cutting specific objects out of the graph.

---

## Revised plan for coming weeks:

Week of	Tasks
<b>Nov 19</b>	First half: Parallelize double thresholding (Karen) Second half: Research applicable edge tracking methods (Dustin)
<b>Nov 26</b>	First half: Parallelize edge tracking by hysteresis and edge linking (together) Second half: Image segmentation code clean up and profiling (Dustin) Research image segmentation applications e.g. object cutout (Karen)
<b>Dec 3</b>	First half: Implement object cutout (Karen) Second half: Parallelize object cutout (Dustin)
<b>Dec 10</b>	First half: Prepare demo materials (Dustin) Create poster (Karen) Second half: Prepare oral presentation (together)

---

## Plan for poster session

We plan to include the following things in our final poster session:

1. A demo with our laptop, taking pictures real time from the live and generate image segmentation.
2. A brief introduction of the original algorithms, occupying 1/3 of the poster, with roughly 100 words and a few image demo.
3. A brief introduction of our parallel strategy with a few image demo ,occupying 1/3 of the poster.
4. Plots of speedup on different devices. Occupying 1/3 of the poster.

---

## Preliminary results

Since we are working on a parallel application, our preliminary results are mostly implementation success. We manage to produce a complete edges and segmentations and test it on multiple sample images.

From a performance perspective, we haven't begun to do any measurement for now, and therefore does not know the extent to which our parallel solution is accelerated.

---

## Issues & Concerns

We have no big concerns at this moment, and everything follows the planned timeline. The only possible concern might be the algorithm design for the parallel segmentation, since we have thought about the algorithm carefully yet, and the design of a good algorithm might take a long time. Overall, the project is on a good track.