Malte Schwarzkopf, St John's College, `ms705@cam.ac.uk`

Proteus – Project Progress Report – Week 7

Summary

Not very much work beyond the initial Sobel kernel implementation was done this week due to a variety of reasons. Some work has been delayed until after the end of term.

What I intended to do

- Implement convolution with kernel for entire image, write output to file, compare the reference output
- Implement mechanisms for copying annotations between frames (no interpolation yet, just straight copying)
- If enough time, implement edge detection around current mouse position/around current projected line
- In order to be able to do the above, read papers on Shi-Tomasi feature tracker, investigate line integral calculation and mean-squared error calculation

What I ended up doing

- Implemented Sobel kernels, tried various other first-order kernels and compared to Laplacian. Sobel kernels seem to give the best result
- Looked at the Kanade-Lucas-Tomasi Feature Tracker implementation[1] (referenced by the Agarwala paper), and decided to give it a try as a possible advanced interpolation method
- Various small fixes: Mouse interaction bugs, stability issues

- Not very much apart from that (didn't do any work on the project in the second half of the week).

Where I am in the timetable

Again about a week behind; this is mostly due to supervisions accumulating at the end of term and me having a few things going on in college (Scholars' Dinner on Friday, Advent Hall on Sunday) that took up the rest of my time. I expect to be able to concentrate more on project work in the second half of the coming week; however, with my PhD application going on concurrently, I will also need some time to devote to that.

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[1] `http://www.ces.clemson.edu/~stb/klt/`

Problems/Issues encountered

The Laplacian operator (second order method) did not work as well as expected; lack of normalisation also posed issues with assessing the output of the convolution filter application. It turned out that (most likely) using Sobel kernels will yield better results.

Apart from this and a general lack of time, none :)

What I intend to do

- Actually implement line snapping according to the method discussed in the supervision on Tuesday (use summation of gradient magnitudes along projected line as approximation to the line integral)
- Implement annotation copying and linear interpolation between frames
- If time permits, try to experimentally integrate the KLT tracker for proper feature tracking between frames
- If time permits, start planning how to organise the work on the next two milestones (which are fairly major steps in the project)
- Generally get a better sense of what I can possibly achieve and be less optimistic about the amount of time I will have available

Further remarks

None.