Research Log - Week 13

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August 14, 2016

August 7, 2016

Worked on Python program OpenGL aspects for implmenting [Fusiello1999] [1] in Python.

August 8, 2016

Started reading [Hong2004] [2]. It was a little over my head. After looking for a tutorial online I found `https://www.inf.ethz.ch/personal/ladickyl/CVPR_Tutorial2015.htm`, which is based on [Boykov2001] [3]. I added it to my reading list.

Revamped working of Python demo program, and worked on additional coding.

August 9, 2016

I spent most of the day working some more on *Demo program*. Spent a little time reading [Hartley2004] [4].

SUMMARY: Relating to *Projective Geometry* discussed on June 29, 2016, *Points at infinity* are all points $\mathbf{P}_\infty = [x_1, x_2, 0]^\intercal$ such that $x_3 = 0$. All such points lie on a single line $\mathbf{l}_\infty = [0, 0, 1]^\intercal$ referred to as a *line at infinity*. A *point at infinity* and *line at infinity* can be mapped to a *finite point* and *finite plane* via a *projective transformation* but lie fixed at *infinity* under an *affine transformation*.

August 11, 2016

UPDATE: Started coding process for *spectral clustering* detailed on August 5, 2016. Completed items on **1. Downsample original image and perform spectral clustering**, **3. Partition original size image**. I still need to code **5. Join segmented sub areas**. Majority of **2. Perform spectral clustering down sampled image** and **4. Perform spectral clustering on sub-area images** items had previously been coded before issues with memory limitiations had been discovered.

I put in an additional help-ticket to `MatLab` support regarding issues logging into `MathWorks` cloud.

August 13, 2016

Tried install OpenNI drivers on linux to work with `PrimeSense` and `Kinect` devices. Its requiring alot of debugging.

References

[1] Andrea Fusiello, Emanuele Trucco, Alessandro Verri, and Ro Verri. A compact algorithm for rectification of stereo pairs, 1999.

[2] Li Hong and G. Chen. Segment-based stereo matching using graph cuts. In *Computer Vision and Pattern Recognition, 2004. CVPR 2004. Proceedings of the 2004 IEEE Computer Society Conference on*, volume 1, pages I–74–I–81 Vol.1, June 2004.

[3] Yuri Boykov, Olga Veksler, and Ramin Zabih. Fast approximate energy minimization via graph cuts. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 23:2001, 2001.

[4] R. I. Hartley and A. Zisserman. *Multiple View Geometry in Computer Vision.* Cambridge University Press, ISBN: 0521540518, second edition, 2004.