Research Log - Week 03

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July 28, 2016

May 29, 2016

Finished [Chen1993] [1]. Not sure if remaining article is of consequence.

Finished MatLab program for *animating / hand-drawing* (See wording in [Chen1993] [1]) offset vectors. Program performs offsets in 2-dimensional space. Conisder adding automatic *feature correspondance* and *z-buffer* information from depth map images avaiable on MiddleBury database.

May 30, 2016

Point-correspondances do not follow even pattern as indicated in [Chen1993] [1]: *Bi-linear coordinates* and *quad partitionions*; May be better to use *Barycentric coordinates triangle partitions*.

Read on MatLab `tform`, `maketform`, and `Delaunay` triangles for purpose of image partitions.

June 1, 2016

Read and finished [Park2003] [2].

SUMMARY: Multiple sections including *point correspondance* and *interpolation*. **Point correspondance**: Breaks images into rectangular partitions. Gets maximum horizontal and vertical pixel gradients using *Sobel operator* in each partition. The maximum gradient in each partition is thresholded to disregard homogeneous and textured regions. **Interpolation**: The images are partitioned with *Delaunay triangulation* using the point correspondances as triangle vertices.

Question for Kamangar: Article published seems to be vastly different depending on source (See `Park2003` folder). ScienceDirect version has more math and detail (maybe too much since it details what a *Sobel filter* is). Why would critical information, including algorithm steps and details, be ommitted?

June 2, 2016

Reviewing PDF at `https://staff.fnwi.uva.nl/l.dorst/hz/chap11_13.pdf` for information on *tri-focal tensor*. Don't understand *practical* calculation of *fundamental matrix* from *Singular Value Decomposition* and *Linear Least Squares* (i.e. don't understand LLS calculation from SVD).

June 3, 2016

Working on implementing *triangle patch transform* in MatLap (using previously mentioned `delaunay`, `tform`, and `maketform` functions) needed for [Chen1993] [1] and [Park2003] [2].

June 4, 2016

Continuting work on getting triangular patches transformed in MatLab. Will use `affine2d` and `imwarp` instead of `maketform` and `imtransform`.

Spent several hours on a false start trying to implement line drawing on pixel data, in order to implment polygon seperation. Finally found MatLab's `roipoly` function which does what I need.

References

[1] Shenchang Eric Chen and Lance Williams. View interpolation for image synthesis. In *Proceedings of the 20th Annual Conference on Computer Graphics and Interactive Techniques*, SIGGRAPH '93, pages 279–288, New York, NY, USA, 1993. ACM.

[2] Joon Hong Park and HyunWook Park. Fast view interpolation of stereo images using image gradient and disparity triangulation. In *Image Processing, 2003. ICIP 2003. Proceedings. 2003 International Conference on*, volume 1, pages I–381–4 vol.1, Sept 2003.