Research Log - Week 10

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July 28, 2016

July 17, 2016

Spent a couple of hours working on *demonstration* code in OpenGL and OpenCV.

July 18, 2016

Spending day working on thesis document. Sections worked on include:

- Intrinsic Calibration Matrix
- Fundamental Matrix

July 19, 2016

Continuing to add material to thesis document, including:

- Extrinsi Calibration Matrix
- Fundamental Matrix

Going back to reread first parts of Chapter 6 from [Hartley2004] [1], as I need clarification on some aspects of the *calibration matrix*. Namely, I *still* do not understand how $\mathbf{X}(\lambda) = \mathbf{P}^{+}\mathbf{x} + \lambda\mathbf{C}$ represents the equation of a ray passing through *optical center* $\mathbf{C}$ in *world space*, with *projection matrix* $\mathbf{P}$.

July 20, 2016

Added material on *fundamental matrix calculation from data* to thesis document. Reading additional material from [Hartley2004] [1] on *fundamenta matrix theoretical calculation*.

July 21, 2016

Continuing to read [Martin2008] [2]. See questions below.

Question for Kamangar: I don't understand the difference between *forward mapping* and *backward mapping*.

I'm a bit confused about most of the material being discussed in [Martin2008] [2]. Will read [Karathanasis1996] [3] for background on *disparity estimation using dynamic programming*.

UPDATE: My question on July 13, 2016 may have been worded wrong: The *dynamic programming* is used for estimating *disparity*, which in turn is used for *point correspondance*. The *dynamic programming* is not used DIRECTLY, in calcuating *point correspondance*.

Orignal question still holds though:

Question for Kamangar: I understand *ALL* of the following to be *TRUE*, which one needs to be *FALSE* (or my understanding revised):

- *Point correspondence* is needed to compute *rectifying homographies*.
- *Rectifying homography* is needed to compute *disparities*.
- *Disparity* is needed to compute *point correspondence*.

July 22, 2016

Started reading [Karathanasis1996] [3], no new information from first few sections.

References

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

[2] N. Martin and S. Roy. Fast view interpolation from stereo: Simpler can be better. In *Fourth International Symposium on 3D Data Processing, Visualization and Transmission*, Proceedings of 3DPVT'08, 2008.

[3] J. Karathanasis, D. Kalivas, and J. Vlontzos. Disparity estimation using block matching and dynamic programming. In *Electronics, Circuits, and Systems, 1996. ICECS '96., Proceedings of the Third IEEE International Conference on*, volume 2, pages 728–731 vol.2, Oct 1996.