Mathematical Methods for Image Synthesis
Readings/Project 5

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In this class you will need to do one project and one article reading that will be presented at the end of the semester. If you take a project with me, you will need to take a reading from Nicolas's part, and conversely, if you take the reading with me, you'll need to take a project from Nicolas. A project is expected to take between 15 and 30 hours, and can be implemented with any *imperative* programming language you want. Readings go much more in-depth than the class lectures, and are thus more complex.

1 Readings 5 - Lectures 10-11

- *Markov Random Field Surface Reconstruction*, Paulsen, Baerentzen, Larsen, IEEE TVCG 2010 `https://www.computer.org/csdl/trans/tg/2010/04/ttg2010040636-abs.html`
- *Efficient Multi-View Reconstruction of Large-Scale Scenes using Interest Points, Delaunay Triangulation and Graph Cuts*, Labatut, Ponse, Keriven, 2007 `http://www.di.ens.fr/sierra/pdfs/07iccv_a.pdf`
- *What energy can be minimized via Graphcut* Kolmogorov, Zabih IEEE TPAMI 2004. `http://www.cs.cornell.edu/~rdz/papers/kz-pami04.pdf`

2 Project 5

This project aims at synthesizing textures using the approaches seen during the class

1. Implement color texture synthesis using the Efros Leung algorithm as seen in class [Efros Leung 01]`https://www2.eecs.berkeley.edu/Research/Projects/CS/vision/papers/efros-siggraph.pdf`
2. Implement texture synthesis using patch copy-pasting and graph-cut seam optimization [Kwatra et al. 2004]`http://www.cc.gatech.edu/~turk/my_papers/graph_cuts.pdf`

Both approaches should be compared on various textures more or less regular.

Assignment For the graphcut part, you can use the toolbox maflow provided by Yuri Borykov `http://vision.csd.uwo.ca/code/maxflow-v3.01.zip`