General
1. Goal: Utilizing the concepts and tools learned in class for analyzing, implementing and modifying an algorithm from the recent literature.
2. The project includes giving a mid-term presentation and submitting the presentation, a final report and code.
3. Projects are individual.

Selecting the project
1. Chose a paper from the list below
   • Papers not in the list are also possible, as long as they are directly related to the course material. If you want a paper not in the list, you should confirm it first.
   • If you have an idea for a project that is not directly related to any specific paper, please confirm it first.
2. Confirm your choice (by email), and set a meeting to discuss what you intend to extend in the paper.

Mid-Presentations
A short 10 minutes talk (~10 slides), including mainly background and analysis of the paper, and an introduction to your creative part (including preliminary results).

Project report
The report will include:
   • Relevant background
   • Summary of the chosen paper(s)
   • Implementation: Implement the algorithm as suggested in the paper
   • Discuss drawbacks / alternative viewpoints / directions that were left unexplored
   • Creative extension: Propose and implement improvements / modifications
   • Conclusion
   • References (cited within the report)

The report should be ~10 pages long. You are welcome to consult about any question you may have regarding the choice of the paper and your suggested extension.

Grade
30% Presentation
70% Report – 35% Understanding and analyzing the paper you chose
            35% Creative part (derivation, implementation, and results)
**Dates**

Choosing a paper and confirming the extension – by the end of the semester

4/7/2016 – Presentations day

11/8/2016 – Project submission

**List of Papers**

- **Fields of Experts: A Framework for Learning Image Priors**
- **Shrinkage Fields for Effective Image Restoration**
- **Discriminative Non-blind Deblurring**
- **“GrabCut” — Interactive Foreground Extraction using Iterated Graph Cuts**
- **Shift-map image editing**
- **From Learning Models of Natural Image Patches to Whole Image Restoration**
- **What makes a good model of natural images?**
- **Solving Inverse Problems with Piecewise Linear Estimators: From Gaussian Mixture Models to Structured Sparsity**
- **Naive Bayes Super-Resolution Forest**
- **A+: Adjusted Anchored Neighborhood**
- **Fast and Accurate Image Upscaling with Super-Resolution Forests**
- **Fast Image Recovery Using Variable Splitting and Constrained Optimization**
- **An Iterative Linear Expansion of Thresholds for L1-based Image Restoration**
- **A Novel SURE-Based Criterion for Parametric PSF Estimation**
- **Demystifying Symmetric Smoothing Filters**
- **Efficient Marginal Likelihood Optimization in Blind Deconvolution**
- **Blind Deblurring Using Internal Patch Recurrence**

Random-forest background (cannot be selected as the main paper): [Decision forests: A unified framework for classification, regression, density estimation, manifold learning and semi-supervised learning](https://www.cs.cmu.edu/~ Ağustín/thesis.pdf)