Statistical Methods in Image Processing 048926

Final Project

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. The work is individual.

Selecting the project

1. Choose a paper from the list below
    - Papers not in the list are also possible, as long as they are 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 10-20 pages long. You are welcome to consult about any question you may have regarding the choice of the paper and your suggested extension.

Final Project 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

4/7/2017 – Presentations day

11/8/2017 – Project submission

List of Papers

Discriminative transfer learning for general image restoration

Learning Non-Local Range Markov Random Field for Image Restoration

Recurrent Inference Machines for Solving Inverse Problems

Discriminative Non-blind Deblurring

What makes a good model of natural images?

Photo-Realistic Single Image Super-Resolution Using a Generative Adversarial Network

Solving Inverse Problems with Piecewise Linear Estimators: From Gaussian Mixture Models to Structured Sparsity

Efficient Marginal Likelihood Optimization in Blind Deconvolution

Blind Deblurring Using Internal Patch Recurrence

A Clearer Picture of Total Variation Blind Deconvolution

Total Variation Blind Deblurring: The Devil is in the Details

Deep Markov Random Field for Image Modeling

Combining Markov Random Fields and Convolutional Neural Networks for Image Synthesis

Joint Learning of Multiple Regressors for Single Image Super-Resolution

Nonparametric canonical correlation analysis