CS 670: Projects

Project parameters

- A project should require the effort of 2-3 homeworks.
- You are free to be more ambitious if you want, but don't bite off more than you can chew!
- These are not "team projects". They are individual projects.
  - However, if you want to propose two projects that go together to produce a system, you can propose such a project.
  - Joint projects should have clear goals for each person.
  - If one person fails to turn in their part, the project should be structured so that the other person's part can still be evaluated.

Project Selection

- Either
  - Select one of the pre-defined projects presented today.
  - Make up your own project
    - If you make up your own, you need to write-up a project plan, and get it approved by Prof. L-M.
    - You should turn in a project plan by Nov. 4th. I will get these back to you by Nov. 11th.

Due date

- Due Dec. 2nd.
- Main requirement:
  - Code (or structure) that works.
  - Write-up that explains what you did and why (1-5 pages).
  - Presentation? Very short, highlights most interesting points.
- Trying to work out presentations (i will be in Australia).

Projects

Face verification algorithms

- Implement recent face verification algorithm:
- Two suggestions:
  - Fisher-vector model (http://www.robots.ox.ac.uk/~vgg/publications/2013/Simonyan13/simonyan13.pdf)
  - PEP model (http://personal.stevens.edu/~hli18/papers/PEMCVPR2013_CameraReady.pdf

Feature Selection

- Redo feature selection assignment using ideas of sub-modular functions (talk to me about this if you want to do it)
- http://submodularity.org/submodularity-slides.pdf

Font-free OCR

- Check out this paper:
  - http://people.cs.umass.edu/~elm/papers/kae_ijdar_11.pdf

Distribution Fields

1. Implement distribution fields for tracking
2. Implement basin-of-attraction studies for new distribution field method (talk to me)

Image stabilization

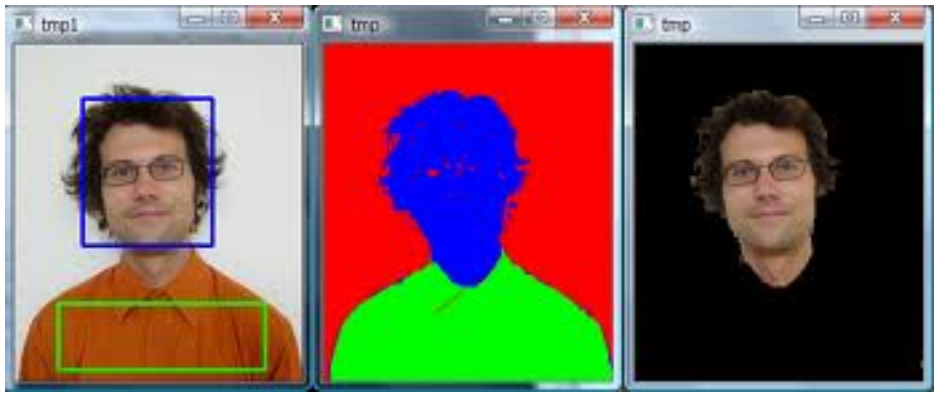
- Implement image stabilization algorithm

SIFT from scratch

- Implement all aspects of the SIFT descriptor from scratch (no libraries).

Bilateral Regression

- Compare Gaussian mixture models and bilateral regression for image segmentation. B. R. is Like GMMs for segmentation, but with regression instead.



Conditional Random Field for Segmentation

Build an Ames Room

- Life size
- Should be dis-assemble-able ☺, so i can use it in the future.

Digital pinhole camera

- Build a pinhole camera with digital camera inside.
  - Can take “infinite depth of field” pictures.