

Final Exam

- 8:30-11:30 am, Mon Dec 8, 2014
- McCullough Bldg., Rm. 115
- Close book
- One single-sided 8.5x11" sheet of notes is allowed in the final
- Everything we did in the lectures and PSs and PAs are fair game
- Important topics are...

Mathematical foundations

- Basic linear algebra definitions
- Vector and matrix operations
- Special matrices
- Eigenvalues and eigenvectors
- SVD
- matrix rank
- matrix transformations
- RANSAC
- Homogeneous coordinates

Filters

- Fundamentals
- Linear Shift Invariant System
- Convolution
- Correlation
- Gradients
- Scale space

Features

- Canny edge
- Harris corner
- DoG
- SIFT
- Optical flow
- Lucas-Kanade feature tracking

Camera models

- Pinhole camera geometry
- Thin lens
- Orthographic and weak perspective
- Intrinsic and extrinsic parameters
- Stereopsis
- Epipolar geometry
- Rectification

Human vision

- The human visual processing pipeline for object recognition
- Edges in the human visual system
- Building invariance across ventral stream

Clustering and Segmentation

- The Gestalt theories
- K-means clustering
- Mean-shift algorithm
- Hierarchical agglomerative clustering

Recognition

- Definitions of object recognition
- Invariance issues
- kNN
- PCA and eigenfaces