# Final Exam

- 12:15-3:15pm, Dec 12, 2016
- Hewlett Teaching Center 201
- Closed book
- One single-sided 8.5x11" sheet of notes is allowed in the final
- Everything we did in the lectures (including guest lectures) and HWs 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