

ECE 510 – Embedded Vision I – Fall 2016

Week 1 – Sept 27, 29

Tue: Course introduction, Computer Vision, OpenCV, Review of Linear Algebra
Thu: LOC (Learning OpenCV) 1-4, Walk through OpenCV data structures and examples
Lab: Lab 1 assigned

Week 2 – Oct 4, 6

Tue: LOC 5, Image Processing, smoothing, morphology
Thu: Flood fill, resize, image pyramids, threshold
Lab: Lab 1 due, Lab 2 assigned

Week 3 – Oct 11, 13

Tue: LOC 6, Image transforms, convolution gradients, Sobel, Laplace
I will be traveling this day I will have a make up time for this lecture
Thu: Canny, Hough transforms, affine, alternate coordinates, Fourier and cosine transforms, Histogram equalization
Lab: Lab 2 due, Lab 3 assigned

Week 4 – Oct 18, 20

Tue: LOC 7, Histograms and matching, basic structure, accessing histograms
Thu: LOC 8, Contours, sequences, contour finding
Lab: Lab 3 due

Week 5 – Oct 25, 27

Tue: Midterm Exam review
Thu: **Midterm Exam**
Lab: Lab 4 assigned

Week 6 – Nov 1, 3

Tue: LOC 9, Image parts and segmentation, background subtractions
Thu: Watershed algorithm, image repair by inpainting, mean-shift segmentation, triangulation
Lab: Lab 4 due, Lab 5 assigned

Week 7 – Nov 8, 10

Tue: LOC 10, tracking and motion, mean shift
Thu: Optical flow, templates, estimators
Lab: Lab 5 due, Lab 6 assigned

Week 8 – Nov 15, 17

Tue: Hardware issues, GPU, IPP/SSE, FPGAs

Thu: Porting CV algorithms to constrained (power, computation, ...) platforms

Lab: Lab 6 due, Assign class project

Week 9 – Nov 22, 24

Tue: LOC 13, Machine learning, Bayes classifier, K-means, boosting Machine learning

Thu: Supervised and unsupervised learning, Gradient descent algorithms, CNNs

Week 10 – Nov 29, Dec 1

Tue: Deep networks, Wrap-up Machine Learning

Thu: Course overview, final exam review

Week 11 – Dec 6

Tue: Final Exam

Lab: Project due