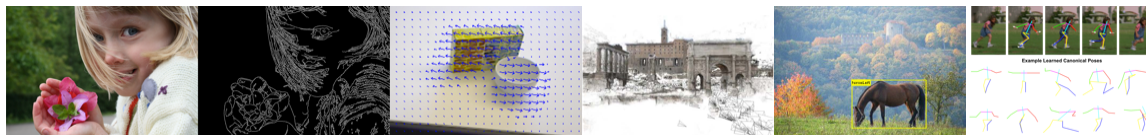# EECS 598-08 Special Topic
Foundations of Computer Vision

Fall 2014

MW 2:30-4:00PM in 1123 LBME

Course Overview: Computer Vision seeks to extract useful information from *images*. This course begins the fundamentals of *image* formation and then organizes the remaining material according to the class of information to be extracted. A rough syllabus is below. The course has been designed to present an introduction to computer vision targeted to graduate students. The course will balance theory and application both in lectures and assignments.

Rough Syllabus:

0. Data Fundamentals: camera models, image formation, range sensing and video.
1. Early Processes: extracting basic features, edges, contours, and segmentation.
2. Motion Tracking: extracting movement, optical flow, tracking, and filtering.
3. Shape: extracting 3D structure, epipolar geometry, stereo, SFM, shape from X.
4. Objects: extracting objects, detection, recognition, and matching.
5. Actions: extracting actions, space-time localization, detection

Differences from EECS 442:   This course and EECS 442 share the same goal: an introduction to modern computer vision. This 598 course will differ from 442 in the level of depth of material, and in topic coverage, such as a greater emphasis in video. EECS 442 is not a prerequisite for this course; nor is any prior course in computer vision. In summary, this is an introductory computer vision course designed for graduate students.

Prerequisites: Graduate standing; students are expected to have a working knowledge of linear algebra, vector calculus, probability and statistics; students are expected to be (or become) proficient in MATLAB. No prior course or experience in computer vision is needed.

Administrative Details: EECS 598-08 will satisfy the same program requirements as EECS 442, except that 598-08 counts 3 credits whereas 442 counts 4. Students cannot earn credit for both 442 and 598-08.

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