
CMPT882: Recognition Problems in Computer Vision

Instructor: Greg Mori

Summer 2009

Overview

Human beings are adept at a variety of visual "recognition" problems, such as recognizing everyday objects or the actions or identities of people. In this course we will explore computer vision techniques that have the grand goal of giving computers these same abilities. Classical techniques and recent original research addressing these problems will be presented.

This course is an 800-level seminar-style course. The goal is to introduce students to important problems and approaches in recognition, especially object recognition and *looking at people* challenges. This will be accomplished by reading research papers on these topics. For each topic, I will present important papers describing methods for attacking the problems. Students will then present recent research papers building on these methods. The semester's work will culminate in a course project in which students will gain in-depth knowledge about solving a recognition problem.

Course website:

<http://www.cs.sfu.ca/~mori/courses/cmpt882/summer09>

Grading scheme:

- 10% Class participation: Students will be expected to participate in discussions of the papers presented.
- 10% Reading assignments: Students will be expected to submit summaries of the one or two papers assigned each week.
- 10% Paper presentation: Each student will be expected to present one paper (of his or her choice) in class.
- 10% Assignment: There will be one programming assignment.
- 60% Project (5 proposal, 20 presentation, 35 report): The main component of this course is a substantial project, which may be done individually or in small groups. Students will give a presentation in the last week of classes, and submit a written report (4-6 pages).

List of topics:

Week 1 (May 4, 6): Administrivia, intro, background on edge detection

Week 2 (May 11, 13): Edge detection, texture

Week 3 (May 20): Greg at conference, guest lecture

Week 4 (May 25, 27): Shape

Week 5 (June 1, 3): Face detection

Week 6 (June 8, 10): Recognition using local features

Week 7 (June 15, 17): Action recognition

Week 8 (June 22, 24): Greg at conference, guest lectures

Week 9 (June 29): student presentations

Week 10 (July 6, July 8): Detecting human figures

Week 11 (July 13, 15): Human pose estimation

Week 12 (July 20, 22): Context, recognizing scenes and locations

Week 13 (July 27, 29): Project presentations

Assignment dates:

A1: Out week 2, in week 4

Project proposal: Out week 5, in week 9

Project report: In Aug. 6

Textbooks:

No required texts. The following books have been placed on hold in the library for reference:

- D. Forsyth and J. Ponce, *Computer Vision: A Modern Approach*
- E. Trucco and A. Verri, *Introductory Techniques for 3-D Computer Vision*
- B. Horn, *Robot Vision*
- C. Bishop, *Pattern Recognition and Machine Learning*