

Syllabus

CS 652 Computer Vision Clarkson University Fall 2009

Instructor: Joachim Stahl
Email: jstahl@clarkson.edu
Meeting times: 1:00pm – 2:15pm
Location: SC 342
Office Hours: TBA

Description:

Computer vision is a frontier field in computer science with the goal of simulating the human visual functions in digital computers, by developing computational algorithms and hardware/software technologies. After taking this course, students will have the necessary knowledge to solve various practical computer vision problems and build a solid background for further computer-vision research.

Course Objectives:

- Students will become familiar with the field of computer vision and its current research topics.
- Students will gain the necessary understanding of the field to be able to critically analyze research papers.

Demonstrable Outcomes:

- Students will be able to solve practical computer vision problems.
- Students will be able to present research papers, and their critiques and findings, in a seminar setting.

Course Topics:

Topics that will be covered during the semester include:

- Image Formation: Computational model of camera, camera calibration, radiometry, sources, shadows and shading, color models.
- Early vision on one image: linear filters, edge detection, texture.
- Early vision on multiple images: geometry of multiple views, stereopsis, structure from motion.
- Mid-level vision: segmentation by clustering, segmentation by model fitting, object tracking with linear dynamic models.
- High-level vision: model-based vision, smooth surfaces and their outlines, aspect graphs, range data, finding template using classifiers.
- Special topics: graph-based image segmentation and perceptual organization.
- Applications: Medical image analysis, finding in digital library, image-based rendering.

Textbook (required):

Computer Vision: A Modern Approach, by David Forsyth and Jean Ponce, Prentice Hall, 2002 (ISBN 0130851981)

Methods of Evaluation:

The most important component of evaluation will be two individual presentations. Students will study relevant papers in computer vision and introduce them to the class. There will also be a midterm exam, which will cover the classic topics on computer vision found in the book, as well as various homework assignment during the semester. Attendance and participation in class will also be graded.

The final grade will be computed on the total score weighted as follows:

Attendance, Participation	10%
Midterm	20%
Presentations	50%
Homework	20%

Grading scheme:

The grading scheme, with the final score between 0 and 100, will be:

A	≥ 90
B+	≥ 85
B	≥ 80
C+	≥ 75
C	≥ 70
D+	≥ 65
D	≥ 60
F	< 60

Submission of Assignments:

All assignments will be submitted electronically before the assigned deadline, using the Blackboard dropbox. Assignments not submitted or submitted after the deadline will receive an automatic failing grade.

Academic Integrity and Cheating Policy:

All work you submit must be your own individual work unless explicitly indicated. In particular, work taken from books, the Internet, other students or any other source may not be submitted as your own. Students found cheating in an assignment will receive a failing grade for that assignment on the first offense, and a failing grade for the course on the second. Students found cheating on an exam will receive a failing grade for the course. Additionally, students found cheating will be subject to academic penalties and disciplinary sanctions under Clarkson's official regulations. Additional information about rights, obligations and procedures related to academic integrity can be found in Section IV of Clarkson's official regulations.

Disclaimer:

The instructor reserves the right to amend this Syllabus during the semester to adapt it to the needs of the course. Any changes will be announced in class and on the class website.