

# CSE598C: Vision-Based Tracking

## Fall 2012 Syllabus

### Instructor:

Robert Collins, Associate Professor, CSE  
354H IST Building  
Phone: 3-1944; email: rtc12@psu.edu  
Office Hours: Tues 2-4, Wed 9-9:50

**Class Schedule:** MWF 10:10AM – 11:00PM; 370 Willard

### Textbook:

**No Textbook.**

### Home Page, Course Notes, Assignments:

Lecture notes and reference material: [www.cse.psu.edu/~rcollins/CSE98C/](http://www.cse.psu.edu/~rcollins/CSE98C/)  
home/project submission and grading will be done in Angel

### Course Topics:

#### 1. Bayesian Filtering

- 1.1 Bayes filter; Kalman filter
- 1.2 Sampling Methods (e.g. Particle Filtering)

#### 2. Appearance-based Tracking

- 2.1 Basic Approaches (e.g. mean-shift; Lucas-Kanade)
- 2.2 Learning/Feature Selection (e.g. boosting)

#### 3. Multi-target Tracking

- 3.1 Data Association Methods (e.g. Hungarian Alg)
- 3.2 Graphical Model Approaches (e.g. MRF)

### Grading:

Homeworks (several)	40%
Programming Projects (three)	50%
Reading/Presentation/Discussion	10%

### Homework and Exams

- Homework assignments will be a combination of math problems and short computer exercises in Matlab (or Octave).
- All homework will be turned in electronically as a \*PDF file\* in Angel. This may require scanning in handwritten sketches or equations, or drawing them in some software package. Take a moment now to figure out how you will do this, so you won't be running around an hour before the first deadline, trying to get your answers into the computer.
- Homework must be done individually.
- Late homework submissions receive a late penalty of 15% per day, including weekends.

**Computer Projects:**

- You can work individually or in a team of two or three.
- If you work in a team, I expect more than if you work individually.
- Computer projects must be done using MATLAB (or Octave, a free Matlab clone).
- **50%** of project grade will be based on a written report detailing the task, methods, experimental findings, and discussion of results.

**Academic Integrity:**

Although you are encouraged to talk to each other to understand the course material and assignment instructions, when it comes time to doing the assignments, every student (or group in the case of group programming assignments) is expected to submit their own original work. For programming, standard and publicly available code libraries (such as simple signal processing or linear algebra libraries) may be used after seeking consent of the course instructor or TA. Please take a look at the list of Penn State academic integrity violations at <http://www.psu.edu/oue/aappm/G-9.pdf> and... don't do any of those things.

**Disabilities:**

Penn State welcomes students with disabilities into the University's educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact the Office for Disability Services (ODS) at 814-863-1807 (V/TTY). For further information regarding ODS, please visit the Office for Disability Services Web site at <http://equity.psu.edu/ods/>.

In order to receive consideration for course accommodations, you must contact ODS and provide documentation (see the documentation guidelines at <http://equity.psu.edu/ods/guidelines/documentation-guidelines>). If the documentation supports the need for academic adjustments, ODS will provide a letter identifying appropriate academic adjustments. Please share this letter and discuss the adjustments with your instructor as early in the course as possible. You must contact ODS and request academic adjustment letters at the beginning of each semester.