

CSC 577 Advanced Topics in Computer Vision

Computer Science, University of Rochester

Syllabus for Fall 2016

Last updated: August 31, 2016

Instructor: Prof. Chenliang Xu

Course Website: <http://www.cs.rochester.edu/u/cxu22/t/577F16/>

Syllabus: <http://www.cs.rochester.edu/u/cxu22/t/577F16/syllabus.pdf>

Meeting Time: Monday, Wednesday 2-3:15pm

Location: 601 CSB

Office Hours: Wednesday 3:15-4:45pm (714 CSB)

Course Description: This course discusses advanced topics and current research in computer vision. Students are expected to read papers selected from various subareas such as reconstruction, segmentation and grouping, object and activity recognition, scene understanding, and vision and language. Approaches for learning from image and video data will be covered and include topics from convolutional neural networks, recurrent neural networks, structured predictions and others. The course will be a mix of lecture, student presentation and discussion.

Course Goals: Gaining research experience in computer vision.

- Get exposed to a variety of topics and become familiar with state-of-the-art techniques.
- Learn to read and evaluate other people's work.
- Get hands dirty on a research project.

Prerequisites:

- Undergraduate- or graduate-level machine learning or computer vision, e.g. CSC 2/449 or CSC 2/446.
- A good working knowledge of C/C++, Java, Python or Matlab.

Course Topics and Rough Schedules:

Learning Methods (3~4 weeks):

- Feedforward Neural Networks
- Structured Prediction
- Recurrent Neural Networks

Papers from the following topics (8 weeks):

- Segmentation and Grouping
- 3D Reconstruction
- Object Recognition
- Semantic Segmentation
- Events, Actions, and Activity Recognition

- Vision and Language

Initial Project Proposal (0.5 week)

Final Project Proposal (1 week)

Textbook: There are no required textbooks. You may find the following books useful as references.

- Szeliski. Computer Vision: Algorithms and Applications. <http://szeliski.org/Book/>
- Forsyth and Ponce. Computer Vision: A Modern Approach. <http://luthuli.cs.uiuc.edu/~daf/CV2E-site/cv2eindex.html>
- Murphy. Machine Learning: a Probabilistic Perspective. <http://www.cs.ubc.ca/~murphyk/MLbook/>
- Koller and Friedman. Probabilistic Graphical Models. <http://pgm.stanford.edu/>

Course Work and Grade

- Paper Review: 30%
- Presentation: 30%
- In-Class Discussion: 10%
- Final Project: 30%

Attendance Policy: Students are required to attend every class in the semester. If you have to skip a class, please notify the instructor beforehand with reasonable excuses. No unexcused absence.

Disabilities: Any students who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. Please contact Center for Excellence in Teaching and Learning at 585-275-9049 in room 1-154 Dewey Hall to coordinate reasonable accommodations for students with documented disabilities.

Academic honesty: All assignments and activities associated with this course must be performed in accordance with the University of Rochester's Academic Honesty Policy. More information is available at: www.rochester.edu/college/honesty. All students are expected to read, understand and follow the policy.