CS 556 – Computer Vision

Catalog Description: Algorithm development for automatic interpretation of the three-dimensional world that is captured in a set of images; cameras and image formation; color; keypoint and edge detection; perceptual grouping; segmentation; shape representation; texture; object recognition; optical flow; motion estimation and tracking; and 3D scene reconstruction from motion and stereo.

Credits: 4 Terms Offered: Fall, alternate years

Structure: Three 50-minute lectures or two 80-minute lectures per week.

Prerequisites: OTHER PREREQS: basic statistics, probability, calculus, linear algebra, and good programming skills

Courses that require this as a prerequisite: none
Instructor: Sinisa Todorovic

Topics

- cameras and image formation
- color
- keypoint and edge detection
- perceptual grouping
- segmentation
- shape representation
- texture
- object recognition
- optical flow
- motion estimation and tracking
- 3D scene reconstruction from motion and stereo

Measurable Student Learning Outcomes:
Students are expected to demonstrate the ability to:

1. Mathematically formulate vision problems covered in class, and explain theories and algorithms that address these problems.
2. Apply algorithms covered in class to automatically interpret real-world images in terms of extracting image features, identifying and segmenting objects in the images, and estimating camera and epipolar-geometry parameters.
3. Develop an approach aimed at addressing a vision problem of interest, not necessarily covered in class, and relate the approach theoretically and experimentally to the state of the art.
Evaluation of Student Performance:
- Homework (20%)
- Midterm (30%)
- Team-based term project (50%) – requires extensive programming & implementation, but also a project proposal, oral presentation, and final report

Learning Resources:

Students with Disabilities:
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Link to Statement of Expectations for Student Conduct, i.e., cheating policies [http://oregonstate.edu/admin/stucon/achon.htm](http://oregonstate.edu/admin/stucon/achon.htm)

7/14/09