CSE 455 Computer Vision

Credits
4.0 (3 hrs lecture)

Lead Instructor
Steven Seitz

Textbook
None

Course Description
Introduction to image analysis and interpreting the 3D world from image data. Topics may include segmentation, motion estimation, image mosaics, 3D-shape reconstruction, object recognition, and image retrieval.

Prerequisites
CSE 303 or CSE 333; CSE 326 or CSE 332; recommended: MATH 308; STAT 391.

CE Major Status
Selected Elective

Course Objectives
Students learn the basics of computer vision and some of the state-of-the-art techniques. They will be able to write programs that can perform image segmentation, image matching, object detection or recognition, and applications such as content-based image retrieval or construction of panoramas. Upon completion of the course they should be able to take an internship or job with a vision company or research lab doing vision or to participate in undergraduate research leading to potential graduate level research.

ABET Outcomes
(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(e) an ability to identify, formulate, and solve engineering problems
(i) a recognition of the need for, and an ability to engage in life-long learning
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Course Topics

- feature detection, descriptors, and matching
- image segmentation
- motion
- mosaics
- 3D sensing and reconstruction
- object recognition