CS696- Applied Computer Vision

Prerequisite: Satisfaction of the Entry-Level Mathematics requirement.

Catalog Description:

This course shall cover concepts, algorithms, and practices of computer vision that are widely used for solving challenging problems. The topics include image processing, feature detection/matching, segmentation, image alignment and stitching, structure from motion, recognition, and tracking.

Topics

Visual perception and its applications	1 week
Geometry and camera models; color space	1 week
Image filtering in spatial and frequency domain	1 week
Image pyramid representation	1 week
Edge detection and filtering	1 week
Interest points and corners	1 week
Feature matching and hough transform	1 week
Model fitting and RANSAC	1 week
Stereo System and epipolar geometry	1week
Feature tracking and optical flow	1 week
Machine learning intro and clustering	1 week
Machine learning and classification	1 week
Recognition overview and bag of features	1 week
Detection with sliding windows	1 week
Class seminar: deep learning and its applications in face recognition	1 week

Grading Guidelines: This class uses coarse grading, based on students' mastery of the concepts, algorithms, theories and practice skills. The grading comprises of the following aspects:

- Homework assignment (50% of grade). There are 5 homework assignments. Each assignment mixes up with problem set, programming and topic discussions; assignment will be due in one week; late submission is only possible when the students contact the instructor at least two days before the submission is due. If a late submission is accepted, there will be reduction in score as a late penalty.
- Final Project (25% of grade). Every student is encouraged to pair with other students in the same class to complete a project.
- Final Exam (25% of grade).
- Extra credits (5% of grade) available to stimulate in-class interactions and extra efforts in homework assignments and projects.

Important Dates

Final Exam: 3:30 -4:45pm, Thursday, December 12, 2019

Class Project Due: 11:59pm, December 18, 2019