CMPT 822 - G100 Computer Vision

Instructor(s): Yasutaka Furukawa

Calendar Objective/Description:
A seminar based on the artificial intelligence approach to vision. Computer vision has the goal of discovering the algorithms and heuristics which allow a two dimensional array of light intensities to be interpreted as a three dimensional scene. By reading and discussing research papers - starting with the original work on the analysis of line drawings, and ending with the most recent work in the field - participants begin to develop a general overview of computer vision, and an understanding of the current research problems.

Instructor's Objectives:
Computer vision is the process of automatically extracting information from images and video. This course covers imaging geometry (camera calibration, stereo, and panoramic image stitching), and algorithms for image or video understanding. The course will provide a coherent perspective on various aspects of computer vision. The grading is based on coding assignments and the final project. There are no mid-term or final exams. The topic of the final project is up to each student, typically an implementation of a paper, significant extension of a previous assignment, or his/her own research project related to computer vision.

Please note:
The course will NOT be taught in a seminar format. The course will be a full lecture format with coding assignments and a final project.

Prerequisites:
Basic knowledge of probability, linear algebra, and calculus. Coding experience on standard data structures and algorithms. MATLAB programming experience is highly desirable.

Topics:
- Camera
- Features
- Image stitching
- Photometric stereo
- Optical flow
- Face
- Segmentation
- Object detection
- Recognition
- Reconstruction
- Deep Learning

Grading:

Reference Books:
Academic Honesty Statement:
Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).