CS-GY 6643 Computer Vision
Course Syllabus (12-4-2017)

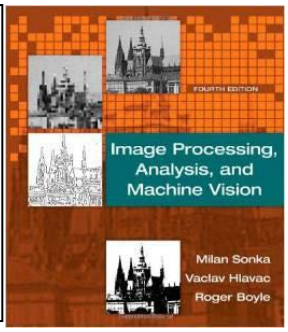
Description: An important goal of artificial intelligence (AI) is to equip computers with the capability of interpreting visual inputs. Computer vision is an area in AI that deals with the construction of explicit, meaningful descriptions of physical objects from images. It includes as parts many techniques from image processing, pattern recognition, geometric modeling, and cognitive processing. This course introduces students to the fundamental concepts and techniques in computer vision.

Pre-requisites: CS 5403 (Data Structures) or equivalent, proficiency in programming and familiarity with matrix arithmetic.

Weekly syllabus:

Week	Topics
1	Introduction Image Representation and Properties
2	Image Preprocessing
3	Edge Detection
4-5	Segmentation
6-7	Region (2D Shape) Analysis
8	Exam 1
9	Texture Analysis
10-11	Image Recognition
12-13	Invariant Features and Interest Points
14	Stereo Imaging
15	Exam 2

- **Required textbook:** Milan Sonka, Vaclav Hlavac and Roger Boyle, *Image Processing, Analysis, and Machine Vision, 4th Edition*, Cengage Learning, Stamford, CT, 2015.
- **Reference book**: David A. Forsyth and Jean Ponce, *Computer Vision: A Modern Approach, 2nd Ed.*, Pearson, 2012.



Instructors: Guido Gerig, Edward Wong

Course load: There will be about 5 to 6 handwritten homework assignments, plus two computer projects that require programming. You can use any high-level programming language to do the projects, but Python, C/C++, Java, or MatLab are the recommended languages. There will be two exams. The second exam will be held during the final exam week and will only cover materials after the first exam.

Grade Distribution:

Homework	10%
Projects	30%
Exam I	30%
Exam II	30%

Policy on Academic Dishonesty:

The School of Engineering encourages academic excellence in an environment that promotes honesty, integrity, and fairness. Any act of academic dishonesty is seen as an attack upon the School and will not be tolerated. Please see the school's policy on academic dishonesty in the Student Code of Conduct:

http://engineering.nyu.edu/files/SACCofC2-2-16.pdf

Common examples include cheating, fabrication, plagiarism and/or unauthorized collaboration. Specifically to this class, students are expected to work *on their own*, as instructed by the Professor. Students may discuss projects with other individuals either in the class or outside the class, but they may not receive code or results electronically from any source that is not documented in their report. *Students must write their own code, conduct their own experiments, write their own reports, and take their own tests*. Any student who is found to be violating this policy will be given a failing grade for the course and will be reported to the authorities, including the CSE department's student records, as described in the University's Student Code.

Moses Center Statement of Disability:

If you are student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities (CSD) at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at

http://www.nyu.edu/students/communities-and-groups/students-with-disabilities.

The Moses Center is located at 726 Broadway on the 2nd and 3rd floors.