COMP 408/508

Computer Vision and Pattern Recognition

Fall 2018 Syllabus

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Course Description and Objectives

COMP 408/508 is a graduate course to introduce the fundamentals of computer vision theory and practice. With recent developments in computing, transmission and display technologies, 2D/3D visual data have become commonplace in scientific, industrial and commercial arenas. The digital visual data are mostly reflections from real world and contain useful information. The main goal of computer vision is to analyze sensed images for extracting this information, to construct scene descriptions and knowledge representations based on this analysis, and thereby to recognize objects and eventually to make useful decisions for automated tasks.

The course is open to graduate and (highly motivated) undergraduate students who are willing to understand the vision technology in conjunction with real world applications and especially very well suited to those who are interested in doing research on computer vision. Good programming skills and knowledge of C/C++ and Matlab are necessary for the course project and homework assignments. Basic DSP knowledge will also be very helpful.

Course Webpage

http://home.ku.edu.tr/~yyemez/comp508/

Follow the course web page closely to catch up with reading assignments, homeworks, exams, projects and any other course related announcements.

Lectures

Tuesday & Thursday, 13:00-14:15, TBA

Textbook:

No required textbooks, but reading from the following books will be helpful:

- Richard Szeliski, Computer Vision: Algorithms and Applications, Springer.

- M. Sonka, V. Hlavac and R. Boyle, *Image Processing, Analysis, and Machine Vision*, Thomson-Engineering.

- Shapiro and Stockman, Computer Vision, Prentice Hall.

Topics to be covered (tentative)

- Imaging and image representations
- Filtering and enhancing images
- Feature Detection and Matching
- Image segmentation
- Object recognition
- 3D vision

Grading

There will be a single *exam* towards the end of the semester.

Homeworks will be given in a regular basis and will contain mostly programming assignments in Matlab and C/OpenCV as well as solving problems from textbooks.

An important part of the course is the term project. By the first month of the semester, every student will have chosen a topic for her/his project. Projects can be either research or application oriented, addressing one of the computer vision concepts covered throughout the course. Depending on the chosen topic, students may be expected to do a literature survey on different techniques aiming at solving the specified problem and to implement and test one of these techniques on a real world problem. You may choose a research-oriented project as well.

There will be no final exam, but instead a project presentation and report will be required.

Final grades will be composed of: (tentative)

Homeworks	30%
Exam	35%
Project	35%

All code and documentation handed in exams, assignments and projects must be your own work. In programming assignments, you can exchange ideas, but you should not ever share your code, even partly.

Enjoy the course!