Quarter: **Fall 2012**
Time: **M 17:45 - 21:00**
Campus: **Loop Campus**
Room **CDM 230**

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Instructor homepage

- Course homepage: http://col.cdm.depaul.edu/default.aspx

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Summary of the course

The applications of imaging technologies are all around us. The health industry produces an abundance of medical images; for instance, diagnostic techniques such as radiology, histopathology, and computerized tomography have produced an explosion in the number of medical images now stored by most hospitals. Military applications of imaging technology, such as recognition of enemy aircraft from radar screens, automatic identification of targets from satellite photographs, and provision of guidance systems for cruise missiles, all represent even more concrete examples which are heavily dependent on imaging techniques for accurate and timely information. Other domains that rely heavily on images are computer gaming, homeland security, microarrays, web, education and training, and fashion and design.

The course is meant to provide students with the basic techniques of image processing and manipulation, so that, after graduation, the student will possess the basic skills to qualify for a job in image processing technologies or to continue with more advanced courses in visual computing. Possible topics covered in the course include: components of an image processing system and its applications, elements of visual perception, sampling and quantization, image enhancement, color spaces, and object edge detection. The image processing techniques will be implemented using MATLAB, the most used software package in image processing. Real world hands on experience is one of the highlights of this course, in which students are expected to implement various image processing techniques in several smaller assignments and a bigger quarter long project.

There are opportunites for research assistantships for the students having the best final projects.

Textbooks and printed resources

Digital Image Processing, Third Edition, Gonzalez and Woods, ISBN 013168728X
http://www.prenhall.com/gonzalezwoods

Prerequisites

Calculus or Linear Algebra

Grading

The homework/programming assignments will be worth 50% of the course grade. Instead of a midterm and a final exam, there will be a literature review and a final project for this course. The literature review will be worth 10% and the final project will be worth 40% (proposal 5%, presentation 10%, and report 25%). Final presentations and demos will be done on November 12th. The final report will be due on November 19th.

The summary of the weights of each assignment for contributing to the final grade is as follows:

Assignment	Weight in final grade
Homework & Programming Assignments	50%
Literature Review	10%
Final Project	40%

The final grade will be assigned according to the following scale:

Percentage Grade	Letter Grade	Manner of fulfillment
95-100	A	Excellent
90-94	A-	
85-89	B+	Very Good
80-84	B	
75-79	B-	
70-74	C+	Satisfactory
65-69	C	
60-64	C-	Poor
55-59	D+	
50-54	D	
0 50	F	

Software

The image processing techniques will be implemented using MATLAB, the most used software in image processing. The software will be available for use in the CDM labs and through the CDM Terminal Services. MATLAB will be taught in class; there will also be two hands-on lab sessions scheduled on Monday, September 17th and Monday, October 1st. The sessions will be recorded and available for both in-class and DL students.

MatLab homepage: http://www.mathworks.com/

Homework/Programming Assignments and Final Project Policies

There will be 5 homework/programming assignments, which are due at the beginning of class one or two weeks after they are assigned. Late assignments will be accepted up to one lecture later than the assigned due date with a 25% penalty this penalty will be assessed in full to assignments turned in from the end of class on the day that the assignment is due up until the beginning of next lecture. No assignments will be accepted beyond the beginning of class one lecture beyond the due date.

The assignments must be submitted online on the Course On Line site at https://col.cdm.depaul.edu. Only legible, organized homework which show your work will be graded. Include your name, section number, date, and homework number on the first page of your assignment.

Extra credit points will be given for additional problems in assignments and active participation in the lectures and Discussion Forum.

Final Project

The purpose of the final project is to demonstrate your ability to apply the knowledge and the techniques learned during this course. The final project for this class is more extensive analysis task, chosen by you from among the topics we discuss. Final projects will include a presentation to the rest of the class at the end of the quarter, in place of a final exam. As part of your final project, you will also be asked to critique your classmates projects. These critiques will be collected by me, collated, and passed on anonymously to the presenter.

Whenever it is possible, it is recommended that the DL students attend the final presentations to participate in the live discussions of the final projects and to complete critiques of the other projects. However, appropriate accommodations through SKYPE or WIMBA will be arranged for the DL students not being able to give the presentations in class; the DL students will still have to submit their critiques on the other projects.

Deliverables for the final project:

Proposal (October 15th): One page proposal describing the problem, the proposed approach, and at least three references other than text book or class notes.

Presentation (November 12th): Each project is to be presented using PowerPoint, and the PPT file will have to be submitted to be published on course web site.

Report (November 19th): The report will be written in a format of a paper (abstract, introduction, literature review, methodology, results, discussion, conclusions and future work). The literature review for the final report consists of reading and summarizing about 5 to 6 published papers on the review topic. While the internet can serve as a good source of

information, the DePaul Library also has extensive holdings, most of them available electronically.

Attendance

It is expected that you will attend every class; it is the single most important action you can take in mastering the course objectives. You are responsible for all material covered, assignments delivered or received, and announcements made in class sessions that you miss. For distance learning students, this means viewing the classes in a timely manner, participate in the discussion forum, and being sure to email or call in any questions that you have.

Changes to Syllabus

This syllabus is subject to change as necessary to better meet the needs of the students. Significant changes are unlikely, and will be thoroughly addressed in class. Minor changes, especially to the weekly agenda, are possible at any time. You will be informed of all such changes.

Class Cancellation

Unless DePaul University closes because of weather, we will have class.

School policies:

Online Instructor Evaluation

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over two weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online at https://mycti.cti.depaul.edu/mycti

Email

Email is the primary means of communication between faculty and students enrolled in this course outside of class time. Students should be sure their email listed under "demographic information" at http://campusconnect.depaul.edu is correct.

Academic Integrity Policy

This course will be subject to the academic integrity policy passed by faculty. More information can be found at http://academicintegrity.depaul.edu/

Plagiarism

The university and school policy on plagiarism can be summarized as follows: Students in this course should be aware of the strong sanctions that can be imposed against someone guilty of plagiarism. If proven, a charge of plagiarism could result in an automatic F in the course and possible expulsion. The strongest of sanctions will be imposed on anyone who submits as his/her own work any assignment which has been prepared by someone else. If you have any questions or doubts about what plagiarism entails or how to properly acknowledge source materials be sure to consult the instructor.

Incomplete

An incomplete grade is given only for an exceptional reason such as a death in the family, a serious illness, etc. Any such reason must be documented. Any incomplete request must be made at least two weeks before the final, and approved by the Dean of the College of Computing and Digital Media. Any consequences resulting from a poor grade for the course will not be considered as valid reasons for such a request.

Resources for Students with Disabilities

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential.

To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted either:

PLuS Program (for LD, AD/HD) at 773-325-4239 in SAC 220
The Office for Students with Disabilities (for all other disabilities) at 773-325-7290
Student Center 307