ISC4221-1 ALGORITHMS for SCIENTIFIC APPLICATIONS II

Instructor

Peter Beerli
Office: 150-T DSL
Email: beerli@fsu.edu
Phone: (850) 559-9664

Teaching Assistant

Michal Palczewski
Office: 150-J DSL
Email: michalp@gmail.com
Phone: (850) 345-6017

Lectures (Beerli):

Monday, Wednesday, Friday 10:10am - 11:00am
Dirac Science Library Room 152

Lab-session (Palczewski):

Monday 3:30pm - 6:00pm
Dirac Science Library Room 152

Office Hours

Monday 1:00pm-2:00pm
Friday 1:00-2:00pm or by appointment.

Textbook

No textbook required

Objectives

This course provides the student with an introduction to algorithms used for solving discrete problems such as sorting or searching an array, scheduling, determining an optimal path (such as the well-known traveling salesman problem), extracting and interpreting data, etc. In addition to introducing the student to common algorithms for various problems, this course also provides the student with tools to analyze algorithms so that algorithms which solve the same problem can be compared.

Content

The course is divided into eight parts:

- Part I - Introduction to Algorithm Design and Analysis
- Part II - Random Processes
- Part III - Graph Theory
- Part IV - Data Mining
- Part V - Clustering
- Part VI - Optimization
- Part VII - Feature Extraction and Pattern Recognition
- Part VIII - Computational Geometry

Grading

The grade for the course will be based upon labs, homework, a midterm and a final project. This work is weighted as follows:
Midterm Exam - 15%
Final Project - 15%
Homework - 45%
Labs - 25%

Late Assignments

You can turn in one laboratory assignment and one home- work late with no questions asked and no penalty; however, the assignment must be turned in no later than 1 week after its due date. Additional late assignments will be penalized by applying a graded scale which terminates with a 25% reduction at the end of one week; no assignments will be accepted more than a week past the due date. Exceptions to these rules are made only if extenuating circumstances (such as illness, etc.) arise which can be documented.

University Attendance Policy

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy

The Florida State University Academic Honor Policy outlines the Universitys expectations for the integrity of students academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to *"... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University.* (Florida State University Academic Honor Policy, found at http://dof.fsu.edu/honorpolicy.htm.)

Americans With Disabilities Act

Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Student Disability Resource Center; and (2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class. This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center
874 Traditions Way 108
Student Services Building
Florida State University
Tallahassee, FL 32306-4167

voice: (850) 644-9566
TDD: (850) 644-8504
sdrc@admin.fsu.edu
http://www.disabilitycenter.fsu.edu/

Free Tutoring from FSU

For tutoring and writing help in any course at Florida State University, visit the Academic Center for Excellence (ACE) Tutoring Services comprehensive list of tutoring options - see http://ace.fsu.edu/tutoring or contact tutor@fsu.edu for more information. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the hig hest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.

Tentative Schedule

	Monday		Wednesday	Friday
Week 1, 1/4-1/6	-	-	Algorithm D/A	Algorithm D/A
Week 2, 1/9-1/13	Algorithm D/A	Lab 1	Algorithm D/A	Algorithm D/A
Week 3, 1/16-1/20	Holiday	-	Random Processes	Random Processes
Week 4, 1/23-1/27	Random Processes	Lab 2	Random Processes	Random Processes
Week 5, 1/30-2/3	Random Processes	Lab 3	Random Processes	Graphs
Week 6, 2/6-2/10	Graphs	Lab 3	Graphs	Graphs
Week 7, 2/13-2/17	Graphs	Lab 4	Graphs	Data Mining
Week 8, 2/20-2/24	Data Mining	Lab 4	Data Mining	Data Mining
Week 9, 2/27-3/2	Data Mining	Lab 5	Data Mining	Midterm
	——————Spring Break——————			
Week 10, 3/12-3/16	Clustering	Lab 5	Clustering	Clustering
Week 11, 3/19-3/23	Optimization	Lab 6	Optimization	Optimization
Week 12, 3/26-3/30	Optimization	Lab 7	Optimization	Feature extraction
Week 13, 4/2-4/6	Feature extraction	Lab 7	Feature extraction	Feature extraction
Week 14, 4/9-4/13	Feature extraction	Lab 8	Comp. Geometry	Comp. Geometry
Week 15, 4/16-4/20	Comp. Geometry	Final project	Comp. Geometry	Comp. Geometry
	——————Finals week [Presentation of projects] ——————			

Lab 1	1/9	Brute force methods for searching
Lab 2	1/23	Searching applications
Lab 3	1/30, 2/6	Monte Carlo; Random Walks
Lab 4	2/13, 2/20	Graphs
Lab 5	2/27, 3/12	Data Mining
Lab 6	3/19	Clustering
Lab 7	3/26, 4/2	Optimization
Lab 8	4/9	Feature Extraction, pattern recognition
Final project		Presentation in finals week