CS 6463 AT: Computational Geometry
Fall 10

Home

Course Description:

This course will survey a list of geometric algorithms and geometric data structures. Techniques from Computational Geometry are applied in areas such as Databases, Sensor Networks, Visualization, Geographic Information Systems (GIS), VLSI, Robotics, Computer Graphics, and Computer Vision. Many geometric algorithms are elegant and clever, and have esthetical value on their own. The material of the course will be tailored to the interests of the participants. Some of the question that will be addressed are:

- How to efficiently compute the shortest path of a robot in a room full of obstacles.
- How to place security guards (or cameras) in an art gallery.
- How to compute the convex hull, the Voronoi diagram and the Delaunay triangulation of a point set
- Given a map of rivers and a map of roads, find all the points where a road crosses a river.
- How to simplify a map, or a curve of a function, without loosing too much of the information.
- Efficient ways to compare shapes, for pattern recognition purposes.
- Robustness issues - how to avoid numerical errors that mislead the algorithm.

Please visit the resources page for links to demos and other relevant resources. A good introduction to some computational geometry problems can be found here.

Prerequisites:

Undergraduate Analysis of Algorithms, or consent of the instructor. Please feel free to contact the instructor at carola AT cs.utsa.edu if you have questions.

Class webpage:

http://www.cs.utsa.edu/~carola/teaching/cs6463/fall10/

Time & Place:

Mondays, Wednesdays 7pm - 8:15pm, HSS 3.01.18
Final exam period: Wednesday 12/8/2010, 5pm-7:30pm

Textbooks:

Required:
Computational Geometry: Algorithms and Applications, (3rd Edition), M. deBerg, M. vanKreveld, M. Overmars, O. Schwarzkopf, Springer-Verlag, 2008, IABN 9783540779735

Optional:

- Computational Geometry in C (2nd edition), J. O'Rourke, Cambridge University Press, 2001, ISBN 0521649765
- Lecture notes by David Mount, available here (an older version with different topics is available here)

Instructor:

Carola Wenk
SB 4.01.17
E-mail: carola AT cs.utsa.edu
Phone: 458-4501
Office hours: Mondays 5:30pm - 6:30pm, Thursdays 12:30pm - 1:30pm, and by appointment

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This Syllabus is provided for informational purposes regarding the anticipated course content and schedule of this course. It is based upon the most recent information available on the date of its issuance and is as accurate and complete as possible. I reserve the right to make any changes I deem necessary and/or appropriate. I will make my best efforts to communicate any changes in the syllabus in a timely manner. Students are responsible for being aware of these changes.

Last modified by Carola Wenk, carola @ cs.utsa.edu , 08/03/2012 22:50:21