COT-5520 Computational Geometry

Catalog Description
Design and analysis of efficient algorithms to solve geometric problems: geometric searching, convex hull, proximity problem, Voronoi diagram, spanning tree, triangulation, and graph drawing applications. (3 credits)

Prerequisites
COP-3530 (or equivalents)

Type
Elective for Graduate Students

Course Objectives
Students will learn geometric data structures and efficient solutions to different geometric problems, and relate the knowledge to real applications in graphics, vision, and geometric modeling.

Topics
Introduction to Computational Geometry
Geometric Data Structures
Line Segment Intersection
Linear Programming
Range Searching
Point Location
Voronoi Diagrams
Arrangement and Duality
Delaunay Triangulations
Convex Hulls
Robot Motion Planning
Graph Drawing
Applications

Textbook
Mark de Berg, Otfried Cheong, Marc van Kreveld and Mark Overmars, *Computational Geometry: Algorithms and Applications, Third Edition*, (Springer, 2008).

Grading Policy
Assignments - Problems: 50%
Midterm - Problems: 20%
Final - Hands-on Project: 25%
Participation: 5%

Last Update
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