CS470/CSE414: Geometry and Topology of Grid Generation, Spring 1999					
meetings TuTh 2:00–3:15, 155 Altgeld Hall					
DATE			TOPIC	HW	OPEN PROBLEMS
Tu	1/19	1	Introduction and overview		
			I. Two-dimensional Meshes		
Th	1/21	2	Delaunay triangulations		Empty convex hexagons
Tu	1/26	3	Edge flipping		Convex unit distance
Th	1/28	4	Randomized incremental construction		Bichromatic minimum distance
Tu	2/ 2	5	Delaunay refinement	hw 1	Collinear points
			II. Combinatorial Topology		
Th	2/ 4	6	Simplicial complexes		Minmax area triangulation
Tu	2/ 9	7	Spaces and manifolds		Counting triangulations
Th	2/11	8	Euler characteristic	hw2	Shelling 3-complexes
			III. Surface Decimation		
Tu	2/16	9	Edge contraction algorithm		Union of unit disks
Th	2/18	10	Preserving topology		Intersection of unit disks
Tu	2/23	11	Simplicial maps		Developing convex polytopes
Th	2/25	12	Error measure	hw3	Inverting unfoldings
			IV. Shape Reconstruction		
Tu	3/ 2	13	Near neighbor graphs		Halving edges
Th	3/ 4	14	Two-dimensional alpha shapes		Crossing triangles
Tu	3/ 9	15	Restricted Delaunay triangulations		Betti numbers in $\mathbb{R}^4$
Th	3/11	16	Crust	hw4	Optimal lofting
Tu	3/16		`Spring break`		
Th	3/18		`Spring break`		
			V. Three-dimensional Meshes		
Tu	3/23	17	Voronoi and Delaunay complexes		sorting $X + Y$
Th	3/25	18	Flipping		Average size Delaunay complex
Tu	3/30	19	Delaunay refinement		Space-tiling tetrahedra
Th	4/ 1	20	Slivers	hw5	Size of hexahedral meshes
			VI. Polyhedral Combinatorics		
Tu	4/ 6	21	Indicator functions		Equipartitions in $\mathbb{R}^4$
Th	4/ 8	22	Non-convex polyhedra		Flip graph connectivity
Tu	4/13	23	Volume by integration	hw6	Shallow inclusion-exclusion
Th	4/15		`Homework Review`		
			VII. Smooth Surfaces		
Tu	4/20	24	Curvature		Conforming Delaunay complexes
Th	4/22	25	Vector space of circles		Unit distances in the plane
Tu	4/27	26	Envelopes and skin		Embedding in $\mathbb{R}^3$
Th	4/29	27	Mixed complexes		Poincaré conjecture