

CONTENTS

Foreword	i
Session 1A (Point Sets 1)	
Maintaining the minimal distance of a point set in less than linear time	1
<i>Michael Smid (Saarbrücken)</i>	
An optimal-time algorithm for ham-sandwich cuts in the plane	5
<i>Chi-Yuan Lo (AT&T, Rutgers) and William Steiger (Rutgers)</i>	
Computing a point in the center of a point set in three dimensions	10
<i>N. Naor (Tel-Aviv) and M. Sharir (Tel-Aviv, Courant)</i>	
Session 1B (Implementation Issues 1)	
Testing geometric objects	14
<i>K. Romanik and C. Smith (Maryland)</i>	
A unified linear-space approach to geometric mini-max problems	20
<i>T. Asano (Osaka), M.E. Houle (Kyushu), H. Imai (Tokyo) and K. Imai (Tsuda College)</i>	
Accurate and efficient algorithms for proximity problems	24
<i>P. Schorn (Zürich)</i>	
Session 2A (Point sets 2)	
Geometric clusterings	28
<i>V. Capoyleas (Rutgers), G. Rote (Waterloo) and G. Woeginger (Graz)</i>	
Canonical cyclic orderings for point sets in the plane	32
<i>A. Saalfeld (Bureau of the Census)</i>	
Session 2B (Implementation Issues 2)	
Topology-oriented approach to robustness and its applications to several Voronoi-diagram algorithms	36
<i>K. Sugihara, Y. Ooishi and T. Imai (Tokyo)</i>	
Rounding face lattices in d dimensions	40
<i>V. Milenkovic (Harvard)</i>	
Session 3A (Separability 1)	
Separating bi-chromatic points by parallel lines	46
<i>T. Asano, J. Hersenberg, J. Pach, E. Sontang, D. Souvaine and S. Suri</i>	
Separating convex sets on the plane	50
<i>J. Czyzowicz (Hull), E. Rivera Campo (México), J. Urrutia (Ottawa) and J. Zaks (Haifa)</i>	
On the expected number of k-sets	55
<i>I. Bárány (Hungary, Yale), W. Steiger (Rutgers)</i>	
Session 3B, (Parallel Algorithms)	
An optimal parallel L ₁ metric Voronoi diagram algorithm	60
<i>Y. C. Wee (Korea) and S. Chaiken (State Univ. of New York at Albany)</i>	

Efficient parallel algorithms on circular arcs	66
<i>L. Chen (Ohio State Univ.)</i>	
Decomposing the star graph into disjoint cycles	70
<i>K. Qiu, H. Meijer and S. Akl (Queens Univ.)</i>	
 Session 4A (Separability 2)	
Polygonal separators and digital shape recognition	74
<i>B. Bhattacharya and T. Shermer (Simon Fraser)</i>	
A note on separation of plane convex sets	78
<i>E. Rivera Campo (México)</i>	
 Session 4B, (Stabbing)	
Good splitters with applications to ray shooting	81
<i>R.B. Yeuda and S. Fogel (Technion, Haifa.)</i>	
Maximal stabbing of segments in the plane	85
<i>B. Jones and Y. Kee (Saskatchewan)</i>	
 Session 5A (Motion Planning 1)	
Watchman routes under limited visibility	89
<i>S. Ntafos (Texas)</i>	
Characterizing weak visibility polygons and related problems	93
<i>S.K. Ghosh, A. Maheshwari (Bombay), S.P. Pal (Bangalore), S. Saluja and C.E.V. Madhavan (Bombay)</i>	
Improved combinatorial bounds and efficient techniques for certain motion planning problems with three degrees of freedom	98
<i>D. Halperin (Courant) and M. Sharir (Courant, Tel-Aviv)</i>	
 Session 5B (Triangulations 1)	
Good triangulations in the plane	102
<i>T. K. Dey (Purdue)</i>	
A robust parallel triangulation and shelling algorithm	107
<i>I. Beichl and F. Sullivan (Natl. Inst. of Standards and Tech. Maryland)</i>	
Triangulating polygons with holes	112
<i>R. Bar-Yehuda and R. Grinwald (Technion)</i>	
 Session 6A (Motion Planning 2)	
Optimal motion of covisible points among obstacles in the plane	116
<i>J.B. Mitchell and E. L. Wynters (Cornell)</i>	
On coordinate motion through a maze	120
<i>J. Friedman (Stanford), J. Hersenberg (DEC) and J. Snoeyink (Stanford)</i>	

Session 6B (Triangulations 2)

- The atomic strain tensor 125
P.H. Mott, A.S. Argon (MIT) and U.W. Sutter (Zürich)

- Barycentric triangulations of generalized maps 129
P. Lienhardt (Louis Pasteur Univ.)

Session 7A (Motion Planning and Order)

- Spherical orders, planar lattices and obstruction graphs 134
S. Földes (Ecole Polytechnique, McGill)

- Enumerating one-directional blocking relations and embedding them in small areas on the plane 138
W.P. Liu and I. Rival (Ottawa)

- A new approach for drawing a hierarchical graph 142
P. Eades, X. Lin (Queensland) and R. Tamassia (Brown)

Session 7B (Polygons 1)

- Dexterous rotations of polygons 147
D. Rus (Cornell)

- Structure detection for polygon decomposition 152
M. Roussille, V. Brûyère and P. Dufour (Mons-Hainau, Belgium)

- Monotone pieces of chains 156
V. Chandru (Purdue), V.T. Rajan (IBM Watson Res.) and R. Swaminathan (Purdue)

Session 8 (Motion Planning 3)

- Planar conflict resolution for air traffic control 160
Y. Chen, M. Hsieh (U.S. California), A. Inselberg (U.S. California, IBM) and H.Q. Lee (NASA)

- Optimal polygon placement by translation 164
S.P. Pai, B. Dasgupta and C.E.V. Madhavan (Indian Inst. of Science)

Session 8B (Implementation Issues 3)

- An object oriented workbench for experimental geometric computation 172
P. Schorn (Zürich)

- Free-form surface modeling using implicit patches 176
B. Guo (Cornell)

Session 9A (Polygons 2)

- Visibility in finitely oriented polygons 181
V. Estivill-Castro and V. Raman (Waterloo)

- An $O(N \log^* N)$ time algorithm for covering simple polygons with squares 186
R. Bar-Yehuda and E. Ben-Chanoch (Technion)

- Polyhedra: Faces are better than vertices 191
L.S. Heath, P.K. Paripatay and J.W. Roach (Virginia)

Session 9B (Voronoi Diagrams 1)

- Finding constrained and weighted Voronoi diagrams in the plane 200
C.A. Wang (Memorial) and P.Y. Tsin (Windsor)

- Fast algorithms for bounded Voronoi diagrams of restricted polygons 204
A. Lingas (Lund)

- Voronoi diagrams over dynamic scenes 209
T. Ross (Würzburg)

Session 10A (Polygons 3)

- An efficient divide-and-conquer approximation algorithm for hyperrectangular partitions 214
T. Gonzalez, M. Razzazi (Santa Barbara) and Si-Qing Zheng (Louisiana)

- On the complexity of shattering using arrangements 218
R. Freiner, J.S.B. Mitchell and C.D. Piatko (Cornell)

Session 10B (Voronoi Diagrams 2)

- Voronoi diagrams coming from discrete groups on the plane 223
M.L. Mazón and T. Recio (Cantabria)

- Finding geodesic Voronoi diagrams of points in the presence of rectilinear barriers 227
Y.H. Tsin (Windsor) and C.A. Wang (Memorial)

Session 11A, (Visibility and Polygons)

- Minimal obscuring sets: the parallel view case 232
N. Mouawad (McGill)

- Linear-time algorithms for weakly-monotone polygons 236
P.J. Heffernan (Cornell)

- An algorithm for recognizing palm polygons 246
S. K. Ghosh, A. Maheshwari (TIFR, Bombay) and S. P. Pal and C.E.V. Madhavan (Bangalore)

Session 11B (Convex Hulls)

- An algorithm to find the faces of the convex hull in higher dimensions 252
W.M. Stewart (New Brunswick)

- Numerical stability of a convex hull algorithm for simple polygons 257
J.W. Jaromczyk and G.H. Wasilkowski (Kentucky)

- Las Vegas gift-wrapping is twice as fast 261
R.A. Dwyer (North Carolina)

Session 12A, (Visibility)

- Guarding convex sets on the plane 265
J. Czyzowicz (Hull), E.Rivera Campo (Mexico), J. Urrutia (Ottawa) and J. Zaks (Haifa)

- Optimum watchmen in spiral polygons 269
B.J. Nilsson (Lund) and D. Wood (Waterloo)

Session 12B (Voronoi Diagrams 3)	
Dynamic Voronoi diagrams and Delaunay triangulations	273
<i>C.L. Bajaj and W.J. Bouma (Purdue)</i>	
An on-line construction of higher order Voronoi diagrams and its randomized analysis	278
<i>J.D. Boissonnat, O. Devillers and M. Teillaud (INRIA)</i>	
Session 13A, (Ham-sandwich)	
Ham-sandwich sectioning of polygons	282
<i>M. Diaz (Johns Hopkins) and J. O'Rourke (Smith College)</i>	
The convergence rate of the sandwich algorithm for approximating convex figures in the plane	287
<i>G. Rote (Waterloo)</i>	
Cutting the volumes of convex polyhedra by a plane	291
<i>I. Stojmenovic (Ottawa)</i>	
Session 13B (Polygons 4)	
The complexity of minimum convex nested polyhedra	296
<i>G. Das and D. Joseph (Wisconsin)</i>	
Constrained integer approximation to 2-d line intersections	302
<i>S. Metha, M. Mukherjee and G. Nagy (Rensselaer)</i>	
Weighted 1-center problem in a simple polygon	306
<i>S. Kabadi (New Brunswick), Y.P. Aneja (Windsor) and K.P.K. Nair (New Brunswick)</i>	
Session 14A, Steiner Trees	
A reduced grid for rectilinear steiner minimal trees	309
<i>G.M. Shute (Minnesota)</i>	
Using partitioning and clustering techniques to generate rectilinear Steiner trees	315
<i>L.L. Deneen and J.B. Dezell (Minnesota)</i>	
Session 14B (Polygons 5)	
Circumscribing polygon of disjoint line segments	319
<i>A. Mirzain (York)</i>	
Minimum polygon covers of parallel line segments	324
<i>H. Meijer and D. Rappaport (Queen's)</i>	
Session 15A (Visibility 1)	
Link length of rectilinear watchman tours in grids	328
<i>E. Kranakis (Amsterdam), D. Krizanc (Amsterdam, Rochester) and L. Meertens (Amsterdam)</i>	
Computing polygonal chords and the farthest visibility polygon	332
<i>T.C. Kao and G.D. Knott (Maryland)</i>	
Shortest paths, visibility, and optimization in planar curvilinear objects	337
<i>E.A. Melissaratos and D. Souvaine (New Brunswick)</i>	

