Fundamenta Informaticae 22 (1995) 307
IOS Press

PREFACE

This special issue of Fundamenta Informaticae presents a collection of papers in the area of Computational Geometry. The papers were selected from those presented at the Ninth ACM Symposium in Computational Geometry, held in San Diego, California, June 1993. Preliminary versions appeared in the proceedings of this symposium.

It is impossible to cover the entire spectrum of a domain as broad as Computational Geometry is today in a collection of a few papers. Yet, we believe the five papers included in this issue touch upon most of the major issues in the area. They display a good combination of solid mathematical and algorithmic methods applied to major problems in the area; hence their relevance to the main theme and mission of Fundamenta Informaticae. The topics discussed in the papers are rooted in important practical questions, and we hope they will attract the attention of a diverse group of readers.

The special issue begins with a paper by Eppstein, Miller and Teng, which demonstrates an algorithm for finding sphere separators. Small separators are essential in developing efficient divide-and-conquer algorithms for meshes used in many computational approaches to science and engineering problems.

In generalizing geometric algorithms to higher dimensions, it is necessary to understand the implied changes for geometric structures. Icking, Klein, Lê, and Ma show that convex distance functions display unexpected behavior beyond two dimensions. As a consequence, Voronoi diagrams for convex distance functions are not at all analogous to Euclidean Voronoi diagrams in 3-dimensional space.

Kirkpatrick and Snoeyink study the problem of finding the fixed-point of the composition of functions occurring in the context of algorithms for geometric problems. Their technique leads to optimal algorithms for dense packings, Voronoi vertices, and approximations to convex polygons.

The face-to-face decomposition of polyhedra into tetrahedra is an important and challenging problem with applications in the generation of meshes commonly used for finite element analysis. Bern solves and describes algorithms for several special cases in this problem area.

Alon, Rajagopalan and Suri study geometric maximization problems for configurations of non-crossing line segments defined for a finite point set in the plane. They demonstrate results on longest non-crossing matchings, Hamiltonian paths, and spanning trees.

Fundamenta Informaticae thanks all authors for their submissions and the referees for their timely and professional work. It is appreciated both by the authors and the guest editors. The editors of this special issue thank the Editorial Board for the assistance in preparing this collection. Our special thanks go to Professor Helena Rasiowa, the Editor-in-Chief, who was most helpful and supportive in bringing this project to life.

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