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Editorial

This special issue contains a selection of papers from the Twentieth ACM Symposium on Computational Geometry, held on June 9–11, 2004 in Brooklyn, NY, USA. This issue features six fully reviewed papers from the symposium, each of which is representative of the symposium's interest in both its theoretical and applied trends.

The first paper, "Deformable spanners and applications" by J. Gao, L.J. Guibas and A. Nguyen, considers the problem of constructing a spanner that can be maintained in the kinetic model. While the static version of the problem has been investigated extensively, this paper is the first that considers the dynamic version of the spanner problem. The construction in the paper also gives dynamic solutions to several other proximity problems.

In the second paper, "Faster core-set constructions and data-stream algorithms in fixed-dimensions", T.M. Chan shows how to considerably speed up the construction of the core-set introduced by Agarwal et al. for ε-approximating various shape parameters of a point-set (e.g. diameter, width, smallest enclosing cylinder). The main new idea is the use of discrete Voronoi diagrams which is likely to find other applications in the field of geometric approximation algorithms. In a second part, the paper presents space-efficient algorithms for the above problems in the data stream model.

The third paper, "Exact, efficient, and complete arrangement computation for cubic curves" by A. Eigenwillig, L. Kettner, E. Schömer and N. Wolpert, revisits the Bentley–Ottmann sweep-line algorithm for computing an arrangement of planar cubic curves. The authors explore thoroughly the algebraic issues and present a complete solution which is the first robust implementation for the problem. The algorithm handles all degeneracies, provides the correct result and experiments with hundreds of curves are discussed.

The fourth paper, "Intersecting quadrics: an efficient and exact implementation" by S. Lazard, L.M. Peñaranda and S. Petitjean, discusses the implementation of a refined variant of Levin's method for computing the intersection curve of two quadrics exactly. The paper describes a C++ implementation that is shown to be complete and efficient on real data. In addition, the paper provides theoretical bounds on the size of the output coefficients.

The fifth paper, "Approximate convex decomposition of polygons" by J.-M. Lien and N.M. Amato, gives an enjoyable combination of theory and practice on the problem of computing decompositions of polygons into approximately convex pieces. Such decompositions are significantly smaller and can be computed more efficiently than convex decompositions.

In the recent past, several provably correct algorithms for surface reconstruction have been proposed. The sixth paper, "Provable surface reconstruction from noisy samples" by T.K. Dey and S. Goswami, is the first to give theoretical guarantee in presence of noise. Convincing experimental results are reported.

We would like to thank the authors for their submissions, the referees for their thorough work and the Editors-in-Chief of CGTA for their support.

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