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Guest Editor's Foreword

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The 24th Annual Symposium on Computational Geometry took place at the University of Maryland in College Park, Maryland, USA, in June 2008. The program committee invited some of the papers presented at the symposium for submission to this special issue. The papers presented here were refereed according to the usual high standards of *Discrete & Computational Geometry*.

There is a companion special issue in *Computational Geometry: Theory and Applications*, whose papers focus on algorithms. These two special issues make it explicit that the Symposium on Computational Geometry welcomes papers of different nature.

Eight stimulating papers are included in this special issue.

R. Fulek, A. Holmsen, and J. Pach answer a question raised by J. Urrutia and related to regression depth. They show that $\tau(n)$ is asymptotically $\frac{2n}{3}$, where $\tau(n)$ is the smallest number such that for any set of n pairwise disjoint segments in $\mathbb{R}^2$, there is a point p such that any ray (half-line) from p meets at most $\tau(n)$ segments. More generally, using Brouwer's fixed point theorem and Carathéodory's theorem, they prove that $\tau(n) \leq \frac{dn+1}{d+1}$ for sets of n pairwise disjoint convex bodies in $\mathbb{R}^d$.

J. Chun, M. Korman, M. Nöllenburg, and T. Tokuyama give a new definition of the digital ray segments $\mathrm{dig}(op)$ from the origin to each point p in the d-dimensional grid. The system of digital rays satisfies consistency axioms. They prove a tight $\Theta(\log n)$ bound for the maximum Hausdorff distance between $\mathrm{dig}(op)$ and the Euclidean line segment $\overline{op}$ among all points p in a two-dimensional $n \times n$ grid.

J. Demouth, O. Devillers, M. Glisse, and X. Goaoc study the problem of approximate coverings of a convex domain in $\mathbb{R}^d$. Given a covering of the domain by a

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family of convex sets, extracting a covering sub-family of minimal size is a classical *NP*-hard problem. The original approximation problem studied here consists in looking for a sub-family covering the domain except for a small volume.

B. Chazelle and W. Mulzer revisit the popular randomized incremental constructions (RICs). While RICs assume data to be inserted in a sufficiently random order, the authors extend the theory to inputs generated by Markov sources for which these randomness assumptions are not fulfilled. They show that Markov incremental constructions with bounded spectral gap are optimal within polylog factors for several classical geometric problems.

N. Alon, R. Berke, M. Buchin, K. Buchin, P. Csorba, S. Shannigrahi, B. Speckmann, and P. Zumstein study the number of colors allowing each vertex of any plane graph to be colored so that all colors appear on every face. They prove a nearly tight bound for any plane graph whose faces have at least g vertices. They show that the decision problem whether a plane graph is polychromatically 3- or 4-colorable is *NP*-complete.

N. Katoh and S. Tanigawa introduce a general framework for enumerating non-crossing geometric graphs on a given point set in the plane. The framework uses triangulations; it yields faster algorithms than existing ones and can also be used for other enumeration problems for which no algorithms were known.

T. Chan presents a dynamic data structure to maintain an ε-coreset, with respect to extent, with logarithmic update time for any constant ε and any constant dimension. The method yields dynamic $(1+\varepsilon)$-factor approximation algorithms for many problems with the same $O(\log n)$ update time.

L. Castelli Aleardi, É. Fusy, and T. Lewiner extend the definition of Schnyder woods from plane triangulations to triangulations of closed orientable surfaces of arbitrary genus. The construction algorithm proposed is linear for constant genus. These new Schnyder woods allow them to achieve the best known rate for linear time encoding of triangulations of constant positive genus.

I thank all authors and referees for their work, which was impressive both by its high scientific value and its timeliness.