Annual Report 2003

Work Group

Theoretical Computer Science

Prof. Dr. Helmut Alt – Prof. Dr. Günter Rote

January 2004

Institut für Informatik
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1. **Members of the Group**

(a) Professors

Alt, Helmut, Dr.
Rote, Günter, Dr.

(b) Guests

Xia Bican, Bejing, China (April through July)
Dr. Peter Braß (January 14th through 18th, August 11th through 14th)
Sergio Cabello (April 1st through June 30th, Marie-Curie-Program)
Dr. Adrian Dumitrescu (June 11th through July 7th)
Dr. René van Oostrum (May 20th through May 23rd)
Paweł Żyliński (April 1st through July 31st, Marie-Curie-Program)

(c) Assistants, scientific personnel, scholarship holders

Abdo, Hosam (Egyptian government fellowship)
Brehm, Enno (Freie Universität Berlin, until March 31st 2004 Technische Universität Berlin)
Broser, Britta (Freie Universität Berlin)
Buchin, Kevin (graduate program *Combinatorics, Geometry, and Computation*, since May 1st)
Dimitrov, Darko
Felsner, Stefan, Priv.-Doz., Dr. (Freie Universität Berlin, until May 14th)
Hoffmann, Frank, Dr. (Freie Universität Berlin)
Izmestiev, Ivan, Dr. (Freie Universität Berlin, since October 1st)
Klein, Oliver (graduate program *Combinatorics, Geometry, and Computation*, since April 1st)
Klost, Claudia (Freie Universität Berlin, since October 24th)
Knauer, Christian, Dr. (Freie Universität Berlin)
Kortenkamp, Ulrich, Dr. (Freie Universität Berlin, from April 1st 2003 until March 31st 2004 visiting Professor at Technische Universität Berlin)
Kriegel, Klaus, Priv.-Doz., Dr. (Freie Universität Berlin)
Lenz, Tobias (Freie Universität Berlin)
Ribó Mor, Ares (graduate program *Combinatorics, Geometry, and Computation*)
Schulz, Andre (DFG, since June 16th)
Sturm, Astrid (EU)
Walther, Maike (graduate program *Combinatorics, Geometry, and Computation*, since May 1st)

(d) Secretary

Knoll, Tamara (Freie Universität Berlin)

(e) Coordinator of the graduate program
Hoffkamp, Andrea (DFG)

(f) Student assistants
Materlik, Dirk (DFG, FZT 86)

2. Guests and Lectures

Mark de Berg
TU Eindhoven (January 6th)
Lower Bounds for Kinetic Data Structures

Vanessa Kääb
Technische Universität Berlin (January 6th)
Local Search in Resource Constrained Project Scheduling

Daniela Kühn
Universität Hamburg (January 20th)
Large planar subgraphs in dense graphs

Andrzej Dudek
Humboldt-Universität zu Berlin (March 2nd)
Random maximal H-free graphs

Gerhard Wöginger
Technische Universität Twente (February 10th)
Cake cutting problems

Remco Veltkamp
University of Utrecht (May 21th)
Multimedia Algorithmics

Gerd Fischer
Heinrich Heine Universität Düsseldorf (May 26th)
Ruled Varieties - Some Aspects of Linear Algebra from Plücker until today

Christian Haase
Duke University North Carolina (May 26th)
Reflexive polytopes in dimension 2 and 3: the numbers 12, 24, and onion skins.

Marc Noy
Polytechnical University of Catalonia Barcelona (June 2nd)
Tutte polynomials: combinatorics and complexity

Guochuan Zhang
Universität Kiel (June 16th)
Scheduling Parallel Jobs on Networks

Paweł Żyliński
University of Gdansk (June 16th)
Vertex cover and connected guard set

Adrian Dumitrescu
University of Wisconsin (June 30th)
Monotone paths in line arrangements with a small number of directions

Ileana Streinu
Smith College, Northampton (July 14th)
Orienting the Rigidity Matroid

Volker Kaibel
Technische Universität Berlin (July 14th)
On the Graph-Density of Random 0/1-Polytopes

Martin Ziegler
Universität Paderborn, Heinz-Nixdorf-Institut (July 18th)
Computational versus Computable Geometry

Stefan Funke
Max-Planck-Institut Saarbrücken (July 18th)
Algorithmische Geometrie – von Radionetzwerken und Oberflächenrekonstruktionen

Joachim Giesen
ETH Zürich (November 3rd)
Induced Flows

Heiko Schilling
Technische Universität Berlin (November 3rd)
Acceleration of Constrained Shortest Path Computation

Dieter Jungnickel
Universität Augsburg (November 10th)
Finite projective planes with a large abelian group

Andreas Paffenholz
Technische Universität Berlin (November 10th)
New Polytopes derived from Products

Leonidas Guibas
Stanford University (December 15th)
What is new with Kinetic Data Structures?

3. Projects supported by external grants

- European graduate program Combinatorics, Geometry, and Computation financially supported by the the German Science Foundation (DFG)

Participating scientists:	Helmut Alt, Günter Rote
Coordination:	Andrea Hoffkamp
Scholarship holders:	Kevin Buchin
	Oliver Klein
	Ares Ribó Mor
	Maike Walther
Duration of the program:	January 2000 through December 2005

This European graduate program, which exists since January 2000, is a joint initiative with scientists from the Departments of Computer Science and Mathematics at ETH Zurich, Switzerland. The existing cooperation between the main partners Berlin and Zurich will be enhanced by other partner institutes in Belgium, Great Britain, the Netherlands, Poland, the Czech Republic, and Hungary. In Berlin the participating institutions are the three universities in Berlin - Free University, Humboldt University, Technical University - and the Konrad Zuse Center for Scientific Computing.

Discrete mathematics and theoretical computer science are the main research fields in the program. In particular, geometrical aspects will play an important role. The major scientific goal of the program is to intensify the cooperation and interaction between discrete mathematics, algorithmics, and application areas. Therefore, especially at the partner institute in Zurich, faculty members working in application areas like geographic information systems, computer graphics, computer vision, and operations research, are participating.The program is subdivided into four basic research areas: combinatorics, geometry, optimization, and algorithms and computation. In each of these areas at least one of the partners in the program is an internationally renowned center of expertise.

- European graduate program Marie Curie Training Site
  financially supported by the European Commision

Participating scientists:	Helmut Alt, Günter Rote
Coordination:	Andrea Hoffkamp
Scholarship holders:	Sergio Cabello (April 1st through June 30th)
	Paweł Żyliński (April 1st through July 31st)
Duration of the program:	2002 through 2005

The Marie Curie Training Site is connected with the European Graduate Program Combinatorics, Geometry, and Computation. Young researchers pursuing doctoral studies can be supported. They are provided with the possibility of undertaking part of their doctoral studies in a country other than their own. Applicants must already have an advisor and a dissertation project in mathematics, computer science, or a related area at their home university.

The Marie Curie Training Site is a joint initiative of the three universities of Berlin - Free University, Technical University, Humboldt-University - and the Konrad-Zuse-Research Center.

The scientific program ranges from theoretical fundamentals to applications. The areas of research are combinatorics, geometry, optimization, algorithms and computation.

- Project Point Pattern Matching for the Analysis of Gel Images
  financially supported by the German Science Foundation (DFG) until June 30th 2001 and Bio-Rad Laboratories since July 10th 2001

Participants:	Helmut Alt (project leader) Klaus Kriegel, Frank Hoffmann, Darko Dimitrov
Duration of the project:	January 1st 1997 through June 30th 2001 (DFG) July 2001 through December 2003 (Bio-Rad)

This project started as a joint project of the Institute of Computer Science of Freie Universität and Deutsches Herzzentrum (German Heart Center) Berlin. The main topics of research are 2-dimensional gel images, that are produced by high-resolution gelelectophoresis-techniques. The gelelectrophoresis has been established to be a central molecular-biological method for the analysis of the protein/DNA-compound of tissue samples. Each "spot" in a gel image that has been produced by gelelectrophoresis represents one protein appearing in the sample.

Ten years ago, the interpretation of gel images was mainly based on the exact (and time consuming) examination by experienced specialists. Although, in the meanwhile several software packages have been developed, there is still a lot of work to do towards a fully automatical solution of the problem. The main goal of the project is to design and implement algorithms for two essential steps of this analysis procedure: The detection of spots in a given gel image and the gel-matching (assignment of corresponding spots from different pictures).

Within the matching, geometric distortions, that appear when producing protein samples, are to be equilibrated. The corresponding algorithmic problem is a variation of 2-dimensional pattern recognition, where the main difficulty is produced by geometric distortion. The approach developed within this project makes use of methods and data structures of Computational Geometry. Some features of the matching algorithm are completely new (e.g. matching of images which overlap only partially). In the meanwhile these algorithms have proved to be a suitable supplement for some existing gel analysis packages. In consequence, we signed a licensing agreement with Bio-Rad Laboratories on the integration and the further development of our algorithms.

- ECG – Effective Computational Geometry for Curves and Surfaces
  financially supported by the European Community within the 5th framework programme

Participating scientists:	Helmut Alt, Günter Rote (project leaders) Christian Knauer Ulrich Kortenkamp Tobias Lenz Astrid Sturm
Duration of the project:	May 1st 2001 through April 30th 2004

ECG – Effective Computational Geometry for Curves and Surfaces is a continuation project of Galia and CGAL. It is a joint project of six work groups in Sophia Antipolis (lead contractor), Zürich, Saarbrücken, Tel Aviv, Groningen and Berlin. The

main subject are the special problems arising with the proper handling of curves and curved surfaces in computational geometry.
We revisit the field of Computational Geometry in order to understand how structures that are well-known for linear objects behave when defined on curves and surfaces.
Algebraic issues:
Several operations on nonlinear geometric objects, often lying at the algorithm's bottleneck, are equivalent to manipulating polynomials. A fundamental question is the solution of algebraic systems, ubiquitous in the construction of new objects, such as intersections. Another crucial goal is the implementation of primitives with Boolean or discrete output, such as an object is contained in some bounding object.
Robustness issues:
Geometric programs are notorious for their non-robustness: algorithms are designed for a model of computation where real numbers are dealt with exactly and geometric algorithms are frequently only formulated for inputs in general position. This is not simply an academic problem. It is easy to crash any commercial CAD-system. Progress has been made only in recent years. A significant part of the progress was made by the proposers and centers around the so-called exact computation paradigm. We extend this paradigm to curved objects.
Approximating curves and surfaces:
Since algorithms for curves and surfaces are more involved, more difficult to make robust and typically several orders of magnitude slower than their linear counterparts, there is a need for approximate representations. Our objective is to provide robust and quality guaranteed approximations of curves and surfaces.
Patricipating sites:
INRIA Sophia Antipolis - France (coordinator)
ETH Zürich - Switzerland
Freie Universität Berlin - Germany
Rijksuniversiteit Groningen - Netherlands
MPI Saarbrücken - Germany
Tel Aviv University - Israel
Application for a follow-up project ACS (Algorithms for Complex Shapes) has been initiated. The main research themes for ACS will be:
1. Shape representation, approximation, reconstruction, and matching;
2. Motion and evolution;
3. Algebraic methods (for shapes and motion)

- Research Training Network "Combinatorial Structure of Intractable Problems"
  financially supported by the European Community within the 5th framework programme

Participating scientists:	Helmut Alt (subproject leader)
	Stefan Felsner
	Günter Rote
Scholarship holder:	Vincenzo Marra
Duration of the project:	September 1st 2002 through August 31st 2006

This project is an international network aiming for improved mobility and cooperation between member sites in: Barcelona, Berlin, Bielefeld, Bordeaux, Budapest, Oxford, Patras, Pisa and Prague.
The general objective of the project is to build up a framework for the analysis of intractable combinatorial problems focused on the structural aspects of the problems. Toward this goal, we will merge techniques from algebra, logic, geometry, probability and statistical physics. The purpose of such a merging is to gain deeper insight on the intrinsic algorithmic difficulty for the solution of many classical problems in Combinatorics and Graph Theory. As a major breakthrough, the use of high-level mathematical techniques will provide the means to overcome complexity issues by finding approximate solutions based on the structural knowledge of the problems.
Scientific objectives:

- Identifying occurrences of hard instances of combinatiorial problems
- Development of structural approaches for the analysis of hard instances of combinatorial problems
- Development of approximate algorithms based on structural knowledge
- Applications to particular hard problems in combinatorics and graph theory

The subproject implemented at our site is entitled "Geometry and order"

To find or to improve a structure on (large) point sets is a general problem which comes up in various applications. A deeper understanding of the combinatorial structure of point sets, geometric graphs and triangulations carries the potential of opening such problems for further investigations with the powerful tools provided by other areas of mathematics.

- Research Project "Construction of a text-based input module for the interactive geometry software CINDERELLA"
financially supported by the BMBF (federal ministery for education and research) via the project "Design of a decentralized internet-supported teaching-learning enviroment for the mathematics education curriculum" in the framework of the program "Neue Medien in der Hochschule" (new media in universities).

Participating scientists:	Ulrich Kortenkamp (subproject leader) Dirk Materlik
Duration of the project:	January 2001 through December 2003

In this project we develop an extension to the software Cinderella that is capable of understanding written construction texts as they arise in secondary school mathematics education. The written text is transformed into a syntactically correct, formal description of the construction, which can be used inside the software Cinderella. This leads to new methods that can be applied to the teaching of mathematics and to teacher training.

- Research Project F3 of the DFG Research Centre Mathematics for Key Technologies *Visualization of Algorithms*
  financially supported by the German Science Foundation (DFG).

Participating scientists:	Ulrich Kortenkamp (project leader)
	Enno Brehm
	Dirk Materlik
Duration of the project:	March 2002 through March 2006

  Dynamic Geometry deals with the constructional aspects of drawings in a dynamic setup. Several dynamic geometry software systems (DGS) have been developed during the last decade that can handle two-dimensional geometric constructions, e.g. as done with ruler and compass. As opposed to traditional, non-computer-aided, drawings, a dynamic aspect is added to a construction: all steps of a construction are stored by the software and can be recalled for other positions of the base elements, making it possible to move points to other positions while maintaining the mathematical restrictions encoded in the construction.

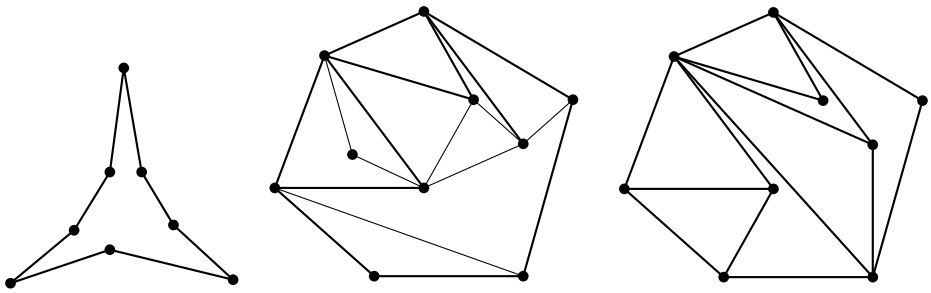
  While a standalone DGS applications in itself is extremely useful for exploring geometry interactively, it is easy to imagine applications which simply make use of a DGS for its own purposes as a tool for calculation and visualization, e.g. CAD systems but also tools for visualizing and animating algorithms.

- Research Project Pseudotriangulierungen und Bewegungen von Gelenkssystemen (Pseudotriangulations and Motions of Frameworks)
  financially supported by the German Science Foundation (DFG)

Participating scientists:	Günter Rote (project leader)
	Andre Schulz
Duration of the program:	March 2003 through February 2005

  A *pseudotriangulation* is a partition of a planar region into polygons with exactly three convex vertices and an arbitrary number of reflex vertices (*pseudotriangles*), see Figure 1. An important subclass are the *pointed* pseudotriangulations, where every vertex is incident to an angle $> 180°$. They have $n - 2$ pseudotriangles and $2n - 3$ edges, and this is the smallest possible number for a pseudotriangulation. This geometric structure plays an important role as a data structure for planning collision-free paths among polyhedral obstacles and in planning non-colliding robot arm motion. Pseudotriangulations have many nice properties.

  A *framework* consists of fixed-length bars (edges) which are connected by movable joints (vertices). Rigidity and flexibility of frameworks is a basic problem of mechanics (statics). Many questions about rigidity can be anwered on the basis of the combinatorial structure of the graph which underlies the framework. The Laman criterion (1971) characterizes minimally rigid frameworks in the plane:



(a) (b) (c)

Figure 1: (a) a pseudotriangle (b) a pseudotriangulation (c) a pointed pseudotriangulation

A *Laman graph* is a graph with n vertices and $2n-3$ edges, such that every subgraph with $k \geq 2$ vertices contains at most $2k-3$ edges.

These graphs are precisely the graphs which are rigid in any sufficiently "generic" embedding in the plane, but which become flexible after the removal of any edge, see Figure 2. Every pointed pseudotriangulation is a Laman graph, and the planar

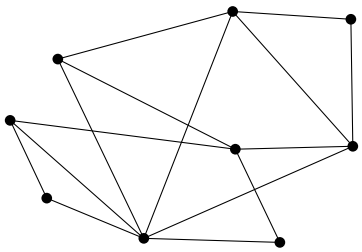


Figure 2: minimal rigid raph

Laman graphs are precisely the graphs which can be embedded as pointed pseudotriangulation.

The purpose of this project is to further explore the connections between pseudotriangulations and rigidity, in order to extend these structures to higher dimensions, and to get an improved understanding of three-dimensional rigidity.

4. Publications and Lectures

(a) Publications in Journals (with a selection procedure)

H. Alt, P. Brass, M. Godau, C. Knauer, C. Wenk. *Computing the Hausdorff distance of geometric patterns and shapes.* The Goodman-Pollack Festschrift. (B. Aronov, S. Basu, J. Pach, M. Sharir eds.). Algorithms and Combinatorics Vol. 25, Springer Verlag 2003, pp. 65–76.

H. Alt, A. Efrat, G. Rote, C. Wenk. *Matching planar maps.* Journal of Algorithms, 49:262–283, 2003.

P. Brass, C. Knauer. *Testing Congruence and Symmetry for General 3-dimensional Objects.* International Journal of Computational Geometry and Applications, 2003. Special Issue: Selected Papers from the 18th European Workshop on Computational Geometry, Warszawa - Miedzeszyn, Poland, Accepted.

H. Connelly, E. Demaine, G. Rote. *Straightening polygonal arcs and convexifying polygonal cycles.* Discrete and Computational Geometry 30 (2003) pp. 205-239.

A. Efrat, F. Hoffmann, C. Knauer, K. Kriegel, G. Rote und C. Wenk. *Covering with ellipses.* Algorithmica 38 (2003), 145–160.

F. Felsner, N. Morawe. *Infeasibility of Systems of Halfspaces.* The Goodman-Pollack Festschrift. (B. Aronov, S. Basu, J. Pach, M. Sharir eds.). Algorithms and Combinatorics Vol. 25, 405–424 Springer Verlag 2003.

I. Izmestiev, M. Joswig. *Branched coverings, triangulations, and 3-manifolds.* Adv. in Geometry 3 (2003), pp. 191–225.

U. Kortenkamp, D. Materlik. *Geometry Teaching in Wireless Classroom Environments using Java and J2ME*, accepted for publication in "Science of Computer Programming (SCP)", special issue on Practice and Experience with Java in Education, Elsevier.

G. Rote, F. Santos, I. Streinu. *Expansive motions and the polytope of pointed pseudo-triangulations.* Discrete and Computational Geometry - The Goodman-Pollack Festschrift. Eds.: B. Aronov, S. Basu, J. Pach und M. Sharir, Algorithms and Combinatorics, 25, Springer Verlag, Berlin, 2003, pp. 699-736.

(b) Publications in Conference Proceedings (with a selection procedure)

O. Aichholzer, G. Rote, B. Speckmann und I. Streinu. *The zigzag path of a pseudo-triangulation.* Algorithms and Data Structures, Proceedings of the 8th International Workshop on Algorithms and Data Structures (WADS 2003), Ottawa, July 2003. Herausgeber: F. Dehne, J.-R. Sack, M. Smid. Lecture Notes in Computer Science 2748, Springer-Verlag, 2003, pp. 377–388.

H. Alt, A. Efrat, G. Rote, C. Wenk. *Matching planar maps.* Proceedings of the 14th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), Baltimore, pages 589–598, 2003.

H. Alt, M. Glisse, X. Goaoc. *On the worst-case complexity of the silhouette of a polytope.* Proc. 15th Canad. Conf. Comput. Geom., pp. 51–55, 2003.

H. Alt, C. Knauer, G. Rote, S. Whitesides. *The complexity of (un)folding.* Proceedings of the Nineteenth Annual Symposium on Computational Geometry, San Diego, pp. 164–170. Association for Computing Machinery, 2003

N. Amenta, S. Choi und G. Rote. *Incremental constructions con BRIO.* Proceedings of the Nineteenth Annual Symposium on Computational Geometry, San Diego, June 8th through 10th, 2003. Association for Computing Machinery, 2003, pp. 211–219.

K. Buchin, M. Walther. *Real-Time Per-Pixel Rendering With Stroke Textures.*

Proceedings of the 19th Spring Conference on Computer Graphics, Budmerice, Slovakia, 2003.

S. Cabello, E. D. Demaine, G. Rote. *Planar embeddings of graphs with specified edge lengths.* Graph Drawing, Proceedings of the 11th International Symposium on Graph Drawing. Perugia, September 2003. Herausgeber: G. Liotta. Lecture Notes in Computer Science, Springer-Verlag, 2003.

S. Felsner. *Lattice structures from planar graphs.* Proceedings Formal Power Series and Algebraic Combinatorics, FPSAC '03. (K.Eriksson, S.Linusson eds.)13 pages.

R. Haas, D. Orden, G. Rote, F. Santos, B. Servatius, H. Servatius, D. Souvaine, I. Streinu, W. Whiteley. *Planar minimally rigid graphs and pseudo-triangulations.* Proceedings of the Nineteenth Annual Symposium on Computational Geometry, San Diego, June 8th through 10th, 2003. Association for Computing Machinery, 2003, pp. 154–163.

G. Rote. *Pursuit-evasion with imprecise target location.* Proceedings of the 14th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), Baltimore, pp. 747–753, 2003.

G. Rote, C. A. Wang, L. Wang, Y. Xu. *On constrained minimum pseudotriangulations.* Computing and Combinatorics, Proceedings of the 9th International Computing and Combinatorics Conference (COCOON 2003), Big Sky, Montana, USA, July 2003. Editors: T. Warnow and B. Zhu. Lecture Notes in Computer Science, Springer-Verlag, 2003 .

(c) Other Publications

H. Alt, A. Efrat, L. Palaniappan, G. Rote, C. Wenk. *Finding a curve in a map (Video).* Video and Multimedia Review of Computational Geometry, Proceedings of the Nineteenth Annual Symposium on Computational Geometry, San Diego, June 8-10, 2003. Association for Computing Machinery, 2003, pp. 384-385.

K. Buchin, M. Walther. *Hatching, Stroke Styles & Pointillism.* ShaderX2 - Shader Tips and Tricks, W. Engel (ed.), Wordware, pp. 340 -347, 2003

M. de Berg, P. Giannopoulos, C. Knauer, R. van Oostrum, R. Veltkamp. *The Area of Overlap of two Unions of Convex Objects under Translation.* Report UU-CS-2003-025, Institute of Information and Computing Sciences, Universiteit Utrecht, 2003.

K.-Y. Chwa, B.-C. Jo, C. Knauer, E. Moet, R. van Oostrum, C.-S. Shin. *Guarding Art Galleries by Guarding Witnesses.* Report UU-CS-2003-044, Institute of Information and Computing Sciences, Universiteit Utrecht, 2003.

Y.-J. Chiang, T. Lenz, X. Lu und Günter Rote *Simple and output-sensitive construction of contour trees using monotone paths.* ECG-TR-244300-01, Mai 2003, 21 Seiten.

U. Kortenkamp, J. Richter Gebert *Cinderella, Japanese Edition.* Springer-Verlag Tokio, November 2003.

U. Kortenkamp *Experimentieren und Publizieren.* Beiträge zum Mathematikunterricht 2003, proceedings of "37. Tagung für Didaktik der Mathematik", Franzbecker, Hildesheim & Berlin. U. Kortenkamp, D. Roozemond *Proving Statements in Planar Geometry using Cinderella.* Internship Report.

S. Jeschke, J. Kirstein, U. Kortenkamp, V. Nordmeier, R. Rass *Empfehlungen zur Ausstattung von Fachraum-Medieninseln für den mathematischen und naturwissenschaftlichen Unterricht.*

G. Rote, A. Sturm *CGAL-based package for the approximation of curves.* Report ECG-TR-244105-01.

G. Rote *Computing the Fréchet distance between piecewise smooth curves.* ECG-TR-241108-01, Mai 2003, 13 Seiten.

(d) Technical Reports

B 03-02 H. Alt, C. Knauer, G. Rote, S. Whitesides. *On the Complexity of the Linkage Reconfiguration Problem.*

B 03-17 Doctorands of Computer Science. *Doctorands'-Workshop October 2003.*

(e) Lectures

Helmut Alt

- *Geometric Methods for the Matching of Patterns and Shapes*, Perspectives Workshop "Multimedia Retrieval", Schloss Dagstuhl, March 13th.
- *Medical Applications of Geometric Pattern Matching*, Workshop on Medical Applications in Computational Geometry DIMACS Center, Rutgers University, USA, April 2nd.
- *Some ideas and prototype implementations for general curves*, ECG Workshop on Software, FU Berlin, June 26th.
- *Geometric Comparsion of Patterns and Shapes*, Prague Midsummer Combinatorial Workshop, July 28th through August 1st.
- *On the Complexity of (Un-)Folding*, Seminar "Effiziente Algorithmen", Math. Forschungsinstitut Oberwolfach, August 13th.
- *Matching Planar Maps*, Seoul Workshop on Computational Geometry 2003,Seoul, Korea, August 25th.
- *Geometric Methods for the Matching of Patterns and Shapes*, Fall School on Computational Geometry, Neustrelitz, October 2nd.
- *Geometric Methods for the Matching of Patterns and Shapes*, Department of Mathematics, University of Hangzhou, China, October 14th.
- *Geometric Methods for the Matching of Patterns and Shapes*, Chinese-German Workshop on Theoretical Computer Science, Shanghai, China October 17th.
- *Geometrische Methoden zum Vergleich von Mustern und Formen*, Colloquium of the Department of Mathematics, Ruhr-Universität Bochum, December 9th.

Kevin Buchin

- *Locality properties of discrete space-filling curves*, Workshop of the graduate program *Combinatorics, Geometry and Computation*, Neustrelitz, September 29th through October 1st.
- *Real-Time Per-Pixel Rendering With Stroke Textures*, 19th Spring Conference on Computer Graphics, Budmerice, Slovakia, April 26th.

Stefan Felsner

- *Lattice structures from planar graphs*, Colloquium of the graduate program *Combinatorics, Geometry and Computation*, Technische Universität Berlin, January 27th.

Ivan Izmestiev

- *Than-Pontryagin construction and MMM classes*, Arbeitsgemeinschaft in Oberwolfach "Homotopy of moduli spaces", October 6th through 10th.

Oliver Klein

- *Lower bounds for shape matching with reference points*, Workshop of the graduate program *Combinatorics, Geometry and Computation*, Neustrelitz, September 29th through October 1st.
- *Untere Schranken fuer den Vergleich geometrischer Formen mit Hilfe von Referenzpunkten*, doctorand's workshop of the computer science institut of Freie Universität Berlin, October 24th through 25th.

Christian Knauer

- *The complexity of (un)folding*, Dagstuhl Seminar on Computational Geometry, March 16th.
- *Controlled perturbation for arrangements of circles*, European Workshop on Computational Geometry CG03, Bonn, March 24th.
- *Datenbanken für geometrische Muster*, Informatikkolloquium Freie Universität Berlin, June 17th.
- *Nearest neighbour search in geometric pattern spaces*, Oberwolfach Seminar on Efficient Algorithms, August 14th.
- *Nearest neighbour search in geometric pattern spaces*, Korean Workshop on computational geometry, Seoul, Korea, August 28th.
- *Nearest neighbour search in geometric pattern spaces*, Noonseminar of the workgroup theoretical computer science of the University Utrecht, Netherlands, October 8th.

Ulrich Kortenkamp

- *Mathematikdidaktisches Kolloquium*, Universität Augsburg, January 14th.
- *Syntaxfreie Konstruktionsbeschreibungen mit Cinderella*, MNU Tagung, Universität Dortmund, March 7th.
- *Formalisiert Konstruieren – Konstruktiv Formalisieren*, Bewerbungsvortrag C4-Professur Didaktik der Informatik und Mathematik, Westfälische Wilhelms-Universität May 24th.
- *Indras Perlen*, Oberseminar Kombinatorische Geometrie, Technische Universität Berlin, June 3rd.

- *Formalisiert Konstruieren – Konstruktiv Formalisieren*, Bewerbungsvortrag Juniorprofessur Didaktik der Mathematik, Technische Universität Berlin, September 8th.
- *Experimentieren und Publizieren*, 21. Herbsttagung des Arbeitskreises „Mathematikunterricht und Informatik“ der GDM, Dillingen, September 26th.
- *Geraden, Kreise und Beweise*, Wissenschaftliche Vortragsreihe, Urania Berlin e.V., November 11th.
- *Teaching Mathematics with Cinderella*, Innovative Teaching of Mathematics with Geometric Algebra – ITMga 2003, Research Insitute for Mathematical Sciences, Kyoto. November 22nd.

Klaus Kriegel

- *Virtual Navigation in Fluoroscopy Based Systems*, Workshop Navigation in Robotics, Dagstuhl, December 10th.

Tobias Lenz

- *Efficient Contour Tree Construction and Computation of Betti Numbers in Scalar Fields*, Workshop on Computational Geometry (EuroCG03), Universität Bonn, March 24th through 26th.
- *Efficient Contour Tree Construction and Computation of Betti Numbers in Scalar Fields*, Berliner Algorithmen Tag (BAT), Humboldt-Universität zu Berlin, July 11th.
- *On the Topology of Contours of d-dimensional Functions*, Doktorandenworkshop des Instituts für Informatik der Freie Universität Berlin, October 24th through 25th.

Ares Ribó Mor

- *Folding a $2 \times n$ grid of paper*, Workshop on Graph Homomorphisms and related topics HOMONOLO 2003, Nova Louka (Czech Republic), September 16
- *A Generalisation of the Maxwell-Cremona Theorem for Self-Touching Configurations*, Workshop on Combinatorics, Geometry and Computation of the CGC–Program , September 30
- *A Generalisation of the Maxwell-Cremona Theorem for Self-Touching Configurations*, Noon Seminar of the Department of Applied Mathematics of the Charles University Prague, October 23rd.

Günter Rote

- *Pursuit-evasion with imprecise target location*, 14th ACM-SIAM Symposium on Discrete Algorithms (SODA 2003), Baltimore, USA, January 12th through 14th.
- *Incremental constructions con BRIO*, Stanford University, Department of Computer Science, January 23rd.
- *Crossing the bridge at night*, Discrete Optimization—Colloquium, celebrating the 60th birthday of Professor Dr. Rainer E. Burkard. Cologne, January 31st through February 1st.
- *Computing Fréchet distances of piecewise smooth curves*, ECG—Effective Computational Geometry of Curves and Surfaces, general workshop and workshop on software, Berlin, June 25th through 26th.

- *How to find a path on a map*, Brandenburgische Technische Universität Cottbus, July 1st.
- *Pursuit-evasion with imprecise target location*, 18th International Symposium on Mathematical Programming, Kopenhagen, August 18th through 22nd.
- *Pseudotriangulations*, Journées de Géométrie Algorithmique 2003, Presqu'île de Giens, Var, France, (survey course), September 15th through 19th.
- *Planar frameworks with plane reciprocals, and pseudotriangulations*, Workshop of the graduate program *Combinatorics, Geometry, and Computation*, Neustrelitz, September 29th through October 1st.
- *Pseudotriangulations in computational geometry*, Fall school on computational geometry of the graduate program *Combinatorics, Geometry and Computation*, Neustrelitz, October 2nd through 4th.
- *The polytope of pointed pseudotriangulations, and Delone and anti-Delone pseudotriangulations*, Workshop on Combinatorial and Discrete Geometry, MSRI (Mathematical Sciences Research Institute), Berkeley, November 17th through 21st.

Andre Schulz

- *Über die Extrempunkte des PPT-Polytopes*, doctorand's workshop of the computer science institut of Freie Universität Berlin, October 24th through 25th.

Astrid Sturm

- *Algorithms for approximating a piecewise smooth curve*, ECG Workshop on Software, FU Berlin, June 26th.
- *An Algorithm for approximating piecewise smooth curves*, ECG Applications Workshop, MPI Saarbrücken, September 24th through 26th.

5. Courses, Seminars, Exercises and Laboratories (WS 02/03 and SS 03)

H. Alt, G Rote, and other lecturers of the graduate program, *Lectures of the graduate program* Combinatorics, Geometry, and Computation, (winter semester 02/03).

H. Alt, *Algorithmen und Programmierung I (algorithms and programming I)*, course and exercises, (winter semester 02/03).

F. Hoffmann, *Informatik A*, course and exercises, (winter semester 02/03).

C. Knauer, *Externe Algorithmen und Datenstrukturen (External Algorithms and Data Structures)*, course and exercises, (winter semester 02/03).

U. Kortenkamp, *Entwurf und Analyse von Algorithmen (design and analysis of algorithms)*, course, (winter semester 02/03).

K. Kriegel, *Mathematik für Informatiker I (Mathematics for computer scientists I)*, course and exercises, (winter semester 02/03).

K. Kriegel, *Mathematik für Informatiker III (Mathematics for computer scientists III)*, course and exercises, (winter semester 02/03).

H. Alt, S. Felsner, K. Kriegel, G. Rote, *Diplomanden- und Doktorandenseminar der Theoretischen Informatik (Seminar for M.S. and Ph.D. students in theoretical computer science)*, seminar, (winter semester 02/03).

S. Felsner, *Ausgewählte Kapitel der Graphentheorie (selected chapters of graph theory)*, seminar, (winter semester 02/03).

F. Hoffmann, K. Kriegel, *Algorithmen zur Analyse von 2DE-Gelbildern (Algorithms to analyse 2DE-Gelpictures)*, seminar, (winter semester 02/03).

C. Knauer, *Komplexitätstheorie (complexity theory)*, seminar, (winter semester 02/03).

U. Kortenkamp, *Seminar über Algorithmen (Seminar about Algorithms)*, seminar, (winter semester 02/03).

H. Alt, G. Rote, and other lecturers of the graduate program, *Colloquium of the graduate program* Combinatorics, Geometry and Computation, colloquium, (winter semester 02/03).

H. Alt, G. Rote, and other lecturers of the graduate program, *Lectures of the graduate program* Combinatorics, Geometry and Computation, (summer semester 03).

H. Alt, *Algorithmen und Programmierung II (algorithms and programming II)*, course and exercises, (summer semester 03).

F. Hoffmann, *Grundlagen der Theoretischen Informatik (basics of theoretical computer scienc)*, course and exercises, (summer semester 03).

F. Hoffmann, *Informatik B*, course and exercises, (summer semester 03).

C. Knauer, *Algorithmische Geometrie (algorithmic geometry)*, course and exercises, (summer semester 03).

C. Knauer, *Anwendungssysteme (application systems)*, course and exercises, (summer semester 03).

K. Kriegel, *Mathematik für Informatiker II (mathematics for computer scientists II)*, course and exercises, (summer semester 03).

R. Rote, *Datenkompression (data compression)*, course and exercises, (summer semester 03).

H. Alt, K. Kriegel, G. Rote, *Diplomanden- und Doktorandenseminar der Theoretischen Informatik (Seminar for M.S. and Ph.D. students in theoretical computer science)*, seminar, (summer semester 03).

K. Kriegel, *Kryptographie*, proseminar, (summer semester 03).

G. Rote, *Graphenzeichnen (graph drawing)*, seminar, (summer semester 03).

T. Lenz, Praktikum *Computergraphik*, (summer semester 03).

H. Alt, G. Rote, and other lecturers of the graduate program, *Colloquium of the graduate program* Combinatorics, Geometry and Computation, colloquium, (summer semester 03).

6. **Organisation of scientific events**

STACS 2003, February 27th through March 1st.
Organization: H. Alt, C. Knauer.

Seminar on algorithmic geometry, Internationales Begegnungs- und Forschungszentrum für Informatik, Schloss Dagstuhl, March 16th through 21st.
Organization: D. Halperin, G. Rote.

Review Meeting of the Projekt ECG - Effective Computational Geometry for Curves and Surfaces , June 24th.
Organization: A. Sturm.

General Workshop of the Projekt ECG - Effective Computational Geometry for Curves and Surfaces, June 25th.
Organization: G. Rote, A. Sturm.

ECG - Effective Computational Geometry for Curves and Surfaces: Workshop on Software, June 26th.
Organization: L. Kettner, A. Sturm.

Annual Workshop of the graduate programm *Combinatorics, Geometry and Computation*, Neustrelitz, September 29th through October 1st.
Organization: H. Alt, A. Hoffkamp.

Fall School of the graduate programm *Combinatorics, Geometry and Computation*, Neustrelitz, October 2nd throgh 4th.
Organization: H. Alt, A. Hoffkamp, G. Rote.

7. **Diplomas**

Miguel Domingo.
Irrfahrten auf Graphen und die Erzeugung zufälliger aufspannender Bäume
(random walks on graphs and the generation of random spanning trees)
Supervisor: Stefan Felsner.

Sarah Renkl.
Orientierte Matroide mit wenigen Mutationen
(Oriented Matroids with few Mutations)
Supervisor: Ulrich Kortenkamp.

Claudia Klost.
Orientierte Matroide und die d-Schritt-Vermutung
(Oriented Matroids and the d-step-conjecture)
Supervisor: Ulrich Kortenkamp

8. **Miscellaneous**

Helmut Alt
- Speaker of the graduate program *Combinatorics, Geometry, and Computation.*
- Speaker of the *Section Theoretical Informatics* (Fachausschuss Theoretische Informatik) of Gesellschaft für Informatik (GI).
- Speaker of the Research Training Network *Combstru* in Berlin.
- Member of the editorial board of *ORDER.*
- Member of the Ph.D. committee for Gerald Weber.

- Member of the commitee for the appointment of an extraordinary professor in practical computer science.
- Chairman, search committee for a junior professorate in theoretical computer science.
- Chairman, search committee for teaching assistants.
- Chair, Program Committee of Symposium on Theoretical Aspects of Computer Science (STACS 2003), Freie Universtät Berlin.
- Co-editor of Proceedings *Symposium on Theoretical Aspects of Computer Science*, STACS 2003. Springer Lecture *notes in Computer Science*, Vol. 2607.
- Co-editor of a special issue of *Theory of Computing Systems* (TOCS) with selected results of STACS 2002
- Referee for DFG - Deutsche Forschungsgemeinschaft (German Science Foundation)
- Referee for various journals and conferences
- Organization of the Annual Workshop of the graduate program *Combinatorics, Geometry, and Computation"*, Neustrelitz, September 29th through October 1st.
- Organization of Fall School on *Combinatorics, Geometry, and Computation"* of the graduate program, Neustrelitz, October 2nd through October 4th.

Britta Broser

- Member of the search committee for a junior professorate in theoretical computer science.
- Referee for *STACS 2004*,
- Referee for *ISAAC 2003*
- Presentation of the *Cinderella Projekt* at the Long Night of the Sciences, Freie Universiät Berlin, June 14th.
- Coordination of the talks in the Noon Seminar until August.
- Coordination of the *Girl's Day* including a course *"Das RSA Kodierungsverfahren"*.

Kevin Buchin

- Referee for *ISAAC 2003*
- Referee for *SODA 2004*
- Referee for the journal *International Journal on Computational Geometry and Applications*.
- Research visit at the University of Calgary (Dr. M. Costa Sousa), July 16th through August 7th.

Stefan Felsner

- Editor for *ORDER*.
- Referee for *ICALP 03*.
- Referee for *SIAM J. Discrete Mathematics*.
- Referee for *STOC 2004*.
- Referee for *ORDER*.

Frank Hoffmann

- Member of the committee for curriculum and examinations in computer science at the FU Berlin.
- Member of the committee for curriculum and examinations in computer science in bioinformatics at the FU Berlin.

- Member of the joint committee for bioinformatics at the FU Berlin.
- Member of the selection committee for the position of professor Mathematics in Life Sciences.
- Member of the selection committee for the position of junior professor theoretical informatics.
- Member of the organizaton committee for STACS 2003
- Referee for *ISAAC 2003*.
- Referee for *SODA 2004*.
- Referee for *FTC 2003*.

Oliver Klein

- Referee for *ISAAC 2003*
- Referee for *SODA 2004*

Christian Knauer

- Member of the departmental council (Fachbereichsrat) mathematics and computer science, Freie Universität Berlin.
- Member of the selection commitee for the temporary succession of Ulrich Kortenkamp.
- Member of the selection commitee for the succession of Christian Knauer.
- Member of the committee for curriculum and examinations in computer science at the FU Berlin.
- Referee for *Computational Geometry: Theory and Applications*.
- Referee for *SODA 2004*
- Organisation of *STACS 2003*, Freie Universität Berlin.
- Research visit at Universität Bonn (Prof. Dr. Rolf Klein), September 8th through 12th.
- Research visit at University of Utrecht (Prof. René van Oostrum), Netherlands, October 6th through 17th.

Klaus Kriegel

- Member of the institute council (Institutsrat) of computer science, Freie Universität Berlin.
- Member of the tutor selection commitee.
- Referee for *ISAAC 2003*.
- Referee for *SODA 2004*.
- Referee for the textbook *Einführung in die Diskrete Mathematik*, Pearson Studium.
- Referee for the textbook *Mathematik für Bioinformatiker*, Springer Verlag.
- Referee for a bachelor assignment in bioinformatic.
- Co-organization of the seminar *Mathematics for pupils*, Freie Universität Berlin, September 8th through 13th.

Ulrich Kortenkamp

- Visiting Professor at Technische Universität Berlin from April 1st throughMarch 31st 2004 in the group of Prof. Günter M. Ziegler
- Council Member of the Workgroup *Computeralgebra of GI, DMV, GAMM*.
- Member Member of CECM, Vancouver, Canada.
- Member of the DFG Research Center Mathematics for Key Technologies.

- Referee for various journals and conferences.
- Part-Time Mathematics Teacher at Heinrich-Hertz-Gymnasium, Berlin, since November.
- Special Consultant for Landschaftsarchitekturbüro Mettler in the competition for further landscaping formation of the Alexanderplatz, Berlin.
- Lecturer at the Summerschool in Blossin, June.

Tobias Lenz

- Member of the institute council (Institutsrat) of computer science, Freie Universität Berlin.
- Referee for *ISAAC 2003*.
- Referee for *SODA 2004*.
- Presentation of the *Cinderella Projekt* at the Long Night of the Sciences, Freie Universiät Berlin, June 14th.

Ares Ribó Mor

- Member of the local organization committee of *STACS 2003*, Freie Universität Berlin, February 27th through March 1st
- Subreferee for *ISAAC 2003*
- Subreferee for *SODA 2004*
- Research stay at the Department of Applied Mathematics of the Charles University Prague, research group of Prof. Jiří Matoušek and Prof. Jan Kratochvil, September 7th through November 31st.

Günter Rote

- Editor of the journal *Computing*.
- Member of program committee for ISAAC2003, 14th Annual International Symposium on Algorithms and Computation, Kyoto, December 15th through 17th.
- Member of program committee for SODA 2004, 5th ACM-SIAM Symposium on Discrete Algorithms, New Orleans, January 11th through 13th 2004.
- Coordinator of the Erasmus/Socrates student exchange program for the departments of mathematics and computer science.
- Project reviewer for *NSERC* (Natural Sciences and Engineering Research Council of Canada).
- Referee for the Conferences:
  European Symposium on Algorithms *(ESA 2003)*
  SoCG 2003, 19th Annual Symposium on Computational Geometry.
  36th ACM Symposium on Theory of Computing *(STOC 2004)*.
  STACS 2004, (21st Annual Symposium on Theoretical Aspects of Computer Science), Montpellier.
- Referee for the journals:
  Networks, Computational Geometry - Theory and Applications, Discrete and Computational Geometry, Computing, Mathematical Methods of Operations Research, Theoretical Computer Science.
- Reviewer (rapporteur) for the Ph.D. dissertation of Julia Flötotto (Nice/Sophia Antipolis).

- Reviewer (rapporteur) and member of the examination jury for the Ph.D. dissertation of Eric Colin de Verdière (ENS Paris).
- Reviewer for the Ph.D. dissertation of Shakhar Smorodinsky (Tel Aviv University).
- 2nd reviewer and examiner for the Ph.D. dissertation of Kathatina Langkau (TU Berlin).
- 2nd reviewer for the diploma thesis of Claudia Klost.
- 2nd reviewer for the diploma thesis of Sara Renkl.
- Organization of the SEMINAR ON ALGORITHMIC GEOMETRY, Internationales Begegnungs- und Forschungszentrum für Informatik, Schloss Dagstuhl, March 16th through 21st. item Organization of the General Workshop of ECG - Effective Computational Geometry for Curves and Surfaces, June 25th.
- Organization of Fall School on *Combinatorics, Geometry and Computation* of the graduate program, Neustrelitz, October 2nd through October 4th.

ANDRE SCHULZ

- Referee for *SODA 2004*.
- Referee for *STACS 2004*.

ASTRID STURM

- Referee for *ISAAC 2003*.
- Referee for *STACS 2004*.
- Referee for *SODA 2004*.
- Organization of the review meeting of ECG - Effective Computational Geometry for Curves and Surfaces, June 24th.
- Organization of the General Workshop of ECG - Effective Computational Geometry for Curves and Surfaces, June 25th.
- Organization of the ECG - Effective Computational Geometry for Curves and Surfaces - Workshop on Software, June 26th, with L. Kettner.
- Coordination of the talks in the Noon Seminar since August.

MAIKE WALTHER

- Referee for *SODA 2004*
- Research visit at the University of Calgary (Dr. M. Costa Sousa), July 16th through August 7th.

Appendix:

Talks in the *Noon Seminar* 12.00 a.m.

January 7th: Günter Rote
Planar systems of equations and generalized nested dissection

January 9th: Günter Rote
Generalized nested dissection with linear storage

January 14th: Tobias Lenz
Computing Betti Numbers in Scalar Fields

January 16th: Ares Ribó Mor
Folding a 2*n grid of paper

January 21st: Klaus Kriegel
Even simplicid decompositions of convex 3-polytopes

January 23rd: Enno Brehm
OpenGeometry - a programming system for visualizing geometry

January 28th: Stefan Felsner
Crossing numbers of complete graphs

January 30th: Ulrich Kortenkamp
Oriented Matroids VII

February 04th: Sarah Renkl
Oriented Matroids VIII

February 06th: Claudia Klost
Oriented Matroids IX

February 11th: Helmut Alt
Fourier-Transform: discrete and fast

February 13th: Christian Knauer
Suffix Arrays

February 18th: Britta Broser
Decidability in Dynamic Geometry

February 20th: Dirk Materlik
A natural-language text input method for geometric constructions

February 25th: Frank Hoffmann
Touring a Sequence of Polygons

March 04th: Günter Rote
Enumeration of the Zigzag Paths of a Pseudotriangulation

March 06th: Günter Rote
Planar Laman graphs and combinatorial pseudotriangulations

March 11th: Darko Dimitrov
Detection of weak symmetry in 2D point set

March 13th: Günter Rote
Critical points of piecewise linear functions of three variables

March 18th: Stefan Felsner
Delaunay triangulations and secondary polytopes

March 20th: Klaus Kriegel
Navigation with a phantom

March 27th: Günter Rote
Fréchet distance for curves

April 1st: Tobias Lenz
On Lower Bounds for Contour Tree Construction

April 3rd: Hosam Abdo
Computing spherical angles by using the orthant probability

April 8th: Astrid Sturm
Douglas-Peucker in CGAL

April 10th: Stefan Felsner
Triangulierungen und Flips

April 15th: Zsuzsanna Liptak

April 17th: Christian Knauer

April 22nd: Inti Cabredo
An iteration method for computing all Eigenvalues of an undefective matrix

April 24th: Paweł Żyliński
k-guarded guards in art galleries

April 29th: Britta Broser
Decidability in Dynamic Geometry II: The Reachability Problem

May 6th: Xia Bican
Algorithms for the classification of real solutions of semi-algebraic systems

May 8th: Ares Ribó Mor
Pseudo Approximation Algorithms, with Applications to Optimal Motion Planning

May 13th: Helmut Alt
Complexity of the silhouette

May 15th: Frank Hoffmann
Pebbles in Art Galleries II

May 20th: Martin Kutz
Computing Smallest Enclosing Balls in High Dimensions

May 22nd: Sergio Cabello
Testing homotopy for paths in the plane II

May 27th: Melanie Win Myint

June 3rd: Kevin Buchin
Logarithmic path-length in recursive space-filling curves

June 5th: Gunnar W. Klau
Fractional Prize-Collecting Steiner Trees in Trees

June 10th: Tobias Lenz
Topological Persistence and Simplification

June 12th: Darko Dimitrov
Finding characteristic points on the sampled surface

June 17th: Klaus Kriegel
Registration of central projections

June 19th: Adrian Dumitrescu
On a coloring problem for the integer grid

June 24th: Sergio Cabello
Placing (and spreading) points

July 1st: Günter Rote
The packet–merge algorithm for optimal length limited codes

July 3rd: Oliver Klein
A new (slow) algorithm for perfect matching

July 8th: Ares Ribó Mor
A Self-Touching Configuration can be perturbed

July 10th: Maike Walther
Near-Linear Time Approximation Algorithms for Curve Simplification in Two and Three Dimensions

July 17th: Paweł Żyliński
Cooperative guards in grids

July 22nd: Astrid Sturm
Polygonal Path Approximation: A Query Based Approach

July 24th: Dan Roozemond, TU Eindhoven
Automatic Geometric Theorem Proving

August 19th: Andre Schulz
Maximum Points of the Polytope of Pointed Pseudo-triangulations (the case of 4 points)

August 21st: Tobias Lenz
Hidden Surfaces: Combining BSP Trees with Graph-Based Algorithms

August 26th: Claudia Klost
Oriented matroids and the d-step conjecture

August 28th: Frank Hoffmann
Searching Graphs with Little Memory

September 2nd: Helmut Alt
Probabilistic Shape Matching

September 4th: Christian Knauer
More Probabilistic Shape Matching

September 9th: Günter Rote
Fréchet distance of several curves

September 11th: Hosam Abdo
The Complexity of Jensen's Algorithm for counting Polyominoes

September 16th: Kevin Buchin
Optimal Numberings of a Square grid

September 18th: Oliver Klein
Detecting short cycles in directed graphs

September 23rd: Maike Walther
Multivariate Asymptotic Notation: A Flaw and a Fix

September 25th: Darko Dimitrov
Surface matching with characteristic points

September 30th: Astrid Sturm
Approximating piecewise smooth curves II

October 7th: Dan Roozemond
Proving Statements in Planar Geometry and Cinderella

October 9th: Klaus Kriegel
On colored paths and graph colorings

October 14th: Andre Schulz
Lifting Pseudotriangulations of a convex Pointset

October 16th: Ivan Izmestiev
Penros Tillings and Quasiperiodicity from 0's and 1's

October 21st: Tobias Lenz
Curve Reconstruction Using Gathan

October 23rd: Helmut Alt
3-Sum Completeness

October 28th: Frank Hoffmann
Guarding Planar Graphs and Polyhedral Terrains

October 30th: Günter Rote
3-Polytopes on small integer grids, and how many spanning trees can a planar graph have?

November 4th: Oliver Klein
Output-Sensitive Algorithms for Computing Convex Hulls

November 6th: Christian Knauer
A simple k-level bound for line arrangements

November 11th: Kevin Buchin
Concentration of Measure using Talagrand's Inequality

November 13th: Maike Walther
Godau's Proof of the NP-hardness of the decision problem for the Frechet metric in higher dimensions

November 18th: Darko Dimitrov
Spin and signature images

November 20th: Maike Walther
Godau's Proof of the NP-hardness of the decision problem for the Frechet metric in higher dimensions 2 - Reducing the selection problem to the Frechet problem

November 25th: Astrid Sturm
An Algorithm for the min-# problem for x-monotone chains using clique covers

November 27th: Hosam Abdo
The Reverse Search for Enumeration

December 2nd: Klaus Kriegel
How to meet your friend in the fog

December 4th: Michael Godau
Mutual information based registration of multimodal 3D images XS

December 9th: Ivan Izmestiev
Configuration spaces of linkages

December 11th: Martin Kutz
Conway's Angel Problem in Three Dimensions

December 16th: Andre Schulz
Properties of the extreme Points of the PPT-polytope

December 18th: Mario Costa Sousa
Fast feature edge extraction in Non-Photorealistic Rendering