Annual Report 2005

Work Group

Theoretical Computer Science

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

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1. **Members of the Group**

(a) Professors

Alt, Helmut, Dr.
Rote, Günter, Dr.
Knauer, Christian, Dr.

(b) Assistants, scientific personnel, scholarship holders

Abdo, Hosam (Egyptian government fellowship)
Buchin, Kevin (graduate program *Combinatorics, Geometry, and Computation*)
Buchin, Maike (graduate program *Combinatorics, Geometry, and Computation*)
Denner-Broser, Britta (Freie Universität Berlin)
Dimitrov, Darko
Hoffmann, Frank, Dr. (Freie Universität Berlin)
Klein, Oliver (graduate program *Combinatorics, Geometry, and Computation*)
Klost, Claudia (Freie Universität Berlin,)
Kriegel, Klaus, Priv.-Doz., Dr. (Freie Universität Berlin)
Lenz, Tobias (Freie Universität Berlin)
Mulzer, Wolfgang (Freie Universität Berlin)
Ribó Mor, Ares (graduate program *Combinatorics, Geometry, and Computation*)
Scharf, Ludmila (Freie Universität Berlin, EU)
Scholz, Sven (Freie Universität Berlin since June)
Schulz, André (DFG, Freie Universität Berlin)
Sturm, Astrid (EU)

(c) Guests

Eyal Ackerman (Marie-Curie-Program since October 28th)
Peter Braß (June 14th - 17th)
Scot Drysdale (since November 1st)
Jeff Erickson (March 1st - May 31st)
Panos Giannopoulos (until September 30th)
Marc Glisse (Marie-Curie-Program April 1st - June 30th)
Esther Moet (September 28th - 30th)
Andreas Spillner (July 19th - 20th)
Anand Srivastav (until January 31st)
Tzvetalin Vassilev (Marie-Curie-Program May 1st - July 31st)
Carola Wenk (May 30th - June 3rd)
Kim Whittlesey (March 1st - May 31st)

(d) Secretary
Knoll, Tamara (Freie Universität Berlin)

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

(f) Student assistants
Driemel, Anne (EU, since October 1st)
Schaust, Sven (DFG, until February 28th)
Zilske, Michael (DFG, until February 28th)

2. Guests and Lectures

Sergio Cabello
University of Ljubljana (February 28th)
Finding Shortest Non-Contractible and Non-Separating Cycles for Topologically Embedded Graphs

Jeff Erickson
University of Illinois at Urbana-Champaign (April 25th)
Tight Regular Arrangements and Shortest Homotopic Paths

Philippe Flajolet
INRIA Rocquencourt (May 2nd)
Singular Combinatorics

Tim J. Tautges
Sandia National Laboratories Albuquerque (May 2nd)
Operations for Modifying Hexahedral Mesh Topology

Johannes Blömer,
Universität Paderborn (July 4th)
Cryptography on smartcards - side-channel attacks and countermeasures

Éric Fusy
INRIA Rocquencourt (July 4th)
Transversal structures on triangulations, with application to graph drawing

Harold Kuhn
Princeton University (October 24th)
57 Years of Optimization: Conjectures and Corrections

Hubert Chen
Humboldt-Universität zu Berlin (October 24th)
The Computational Complexity of Quantified Constraint Satisfaction

Scot Drysdale
Dartmouth College (November 14th)
The Rectilinear Minimum Link-Distance Problem in Three Dimensions

Dirk Schlatter
Humboldt-Universität zu Berlin (November 14th)
Restricted random graph processes

Michel Pocchiola,
École Normale Supérieure, Paris (November 21st)
Computing pseudotriangulations via coverings of the euclidean plane

Eyal Ackerman
Technion-Israel Institute of Technology, Haifa (November 21st)
On the maximum number of edges in k-quasi-planar graphs

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
	Maike Buchin
	Oliver Klein
	Ares Ribó Mor
Duration of the program:	January 2000 - 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:	Eyal Ackerman (since October 28th)
	Marc Glisse (April 1st - June 30th)
	Tzvetalin Vassilev (May 1st - July 31st)
Duration of the program:	2002 - 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.

- 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 holders:	Viktor Blasjö (September 1st - December 31st)
	Éric Fusy (July 1st - September 30th)
	Daniel Kral (until July 31st)
	Krisztian Tichler (May 1st - October 31st)
Duration of the project:	September 1st 2002 - 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

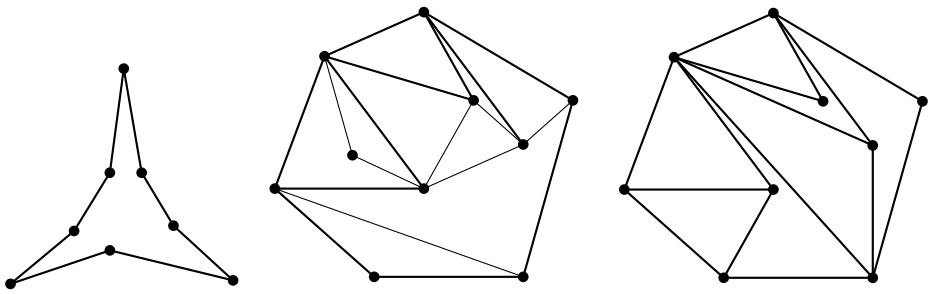
The subproject implemented at our site is entitled "Geometry and order"

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

Participating scientists:	Günter Rote (project leader)
	André Schulz
Duration of the program:	March 2003 - June 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



(a) (b) (c)

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

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 *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

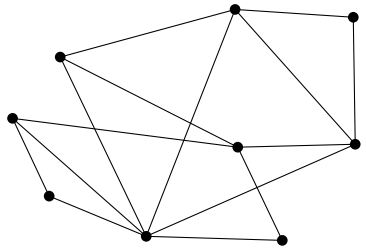


Figure 2: minimal rigid raph

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

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.

- Research Project Virtual Navigation in Fluoroscopy Based Neurosurgery Systems
  financially supported by Schaerer-Mayfield-Technologies

Participating scientists:	Helmut Alt (project leader)
	Robert Günzler
	Frank Hoffmann
	Christian Knauer
	Klaus Kriegel
	Sven Schönherr
	since May 2003

Fluoroscopy is a widely-used imaging technique in neurosurgery. This especially applies to surgery in the region of the spinal column. However, the tradditional use of this technique (during the surgery) causes a considerable radiation exposure of both the surgeon and the patient. To avoid that, the following approach has been developed. In the initial phase of the surgery a few images are gathered as models of an anatomic region. These are snapshots with low radiation exposure. Later, during the surgery, real world data (positions in the operation field) are transformed and displayed into these models. The computation of the correct transformation is the principal aim of our project.

We employ a 3d-tracking system, which is able to gauge positions in the operation

field with high precision. The main idea consists in designing a special point cloud ("phantom") that has the following advantageous property: Any fluoroscopy image of the points allows to recompute the position of the phantom in the path of rays. We have incorporated two aspects in the design of the phantom. Firstly, one must be able to recognize the correct combinatorial matching between points in the image and phanton points. Secondly, the information about the points in the image must be sufficient to recompute the phantom position with high accuracy.
In the medical application a sensor of the tracking system is fixed on the corresponding anatomic object (e.g. bone, vertebra). Only during the image aquisition phase the phantom is attached to the sensor. During the actual surgery one can simultaniously track the positions of an instrument in the operation field and of the fixed sensor. This way one gets the relative position of the instrument to the former phantom position, and thus, it is possible to transform and display the instrument into the model image.

- Research Project ACS (Algorithms for Complex Shapes with certified topology and numerics)
  financially supported by the European Community within the 6th framework IST-Programm by communicating with INRIA Sophia Antipolis, ETH Zürich, Universität Groningen, MPI für Informatik, Saarbrücken, National Kapodistrian Univesrity of Athens (NUA), Universität Tel-Aviv, The GeometryFactory (GF)

Participating scientists:	Günter Rote (project leader)
	Astrid Sturm
Duration of the program:	May 2005 - April 2008

The ACS project aims at advancing the state of the art in computing with complex shapes. Current technolgy can cope well with curves in the plane and smooth surfaces in three-dimensional space. We want to address a larger class of shapes, including piecewise smooth surfaces, surfaces with singularities, as well as manifolds of codimension larger than one in moderately high dimension.

Increasingly demanding applications require efficient and robust algorithms for complex shapes. Topics that arise and that we address are shape approximation (including meshing and simplification), shape learning (including reconstruction and feature extraction), as well as robust modeling (including boolean operations). Our work on these topics will be closely intertwined with basic research on shape representations.

A unique and ambitious feature of our approach is the guaranteed quality of all data structures and algorithms we plan to develop. Through certified topology and numerics, we will be able to prove that the output is topologically and numerically consistent, according to prespecified criteria. A software prototype, dealing with a restricted class of complex shapes, will demonstrate the feasibility of our techniques in practice.

- Research Project PROFI (Perceptually-relevant Retrieval of Figurative Images)
  financially supported by the European Community within the 6th framework IST-Program in cooperation with Utrecht University, University of York and Aktor Knowledge Technology

Participating scientists:	Helmut Alt (project leader) Ludmila Scharf Anne Driemel
Duration of the program:	January 2005 - December 2007

  Perceptually-relevant Retrieval of Figurative Images

  In this collaborative project we aim to invent and develop new techniques for the retrieval of figurative images (such as clip art, logos, signs) from large databases. Our techniques will be based on the extraction and matching of perceptually relevant shape features, thereby overcoming many of the limitations of existing methods. This project will develop new algorithms and systems for:

  Perceptual segmentation of raw images, and grouping of shape elements. (Responsible partner: University of York.)

  Matching of geometrical patterns representing shape features. (Responsible partner: Free University Berlin.)

  Indexing shape features in large databases of figurative images. (Responsible partner: Utrecht University.)

  Indexing the relative spatial layout of shape features within these images. (Responsible partner: Utrecht University.)

  Experimental verification in a prototype system, and performing rigorous evaluations on databases with an independently validated ground truth. (Responsible partner: Aktor Knowledge Technology.)

  The Profi project is funded by the European Commission, meeting the objectives of the Future and Emerging Technologies programme:

  The proposed research is inherently innovative, high-risk and long-term and holds the promise of major advances at a foundational level.

- Research Project Matching-Algorithmen zur Registrierung vom Punktmengen in Flächen und Anwendungen zur medizinischen Navigation mit Trackingsystemen (Matching algorithms for the registration of point sets in surfaces and applications to the medical navigation with tracking systems)
  financially supported by the German Science Foundation (DFG)

Participating scientists:	Christian Knauer Klaus Kriegel
Duration of the program:	August 2005 - February 2008

An increasing number of neurosurgical operations depend on electromagnetic or optical tracking systems. They are developed to determine the relative accurate position of instruments during an operation. These systems allow the navigation in a 3D-model, which is generated based on information taken from a computed tomography or a MRT. This implies that the spacial transformation from real-world coordinates to the coordinate system of the model is known. This problem can be solved by using so-called landmarks which explicitly describe a correlation between points in the operation-field and the model. But this method is limited and can not be applied in all cases e.g. for spinal surgeries. The aim of this project is to determine the rigid transformation that is needed navigate in the model witout using this landmarks. The task can be reduced to the following matching problem: Given a point set in 3D-space (taken from the operation-field) and a surface (the model) one has to compute the rigid transformation that brings the point set as close as possible to the surface. All known solution to this problems base on heuristics (e.g. ICP, simulated annealing). These methods work quite well in practise, but they can't guarantee any quality of the result. But in medical applications guarantees are especially needed and critical. For that reason a heuristic-free solution, using methods taken from the discipline of computational geometry, is desired to solve this challenging problem. The focus of this project lies especially on the following aspects of this problem:

(a) **preprocessing:** generally the transformation shall be computed using geometric hashing. While preprocessing the model, which is not time critical, data structures are build to support this method.

(b) **additional information:** special characteristic points on the surface will be computed while preprocessing the model. The explicit determination of one or more characteristic points significantly reduces the complexity of the problem.

(c) **ambiguity:** if the sampled information is not sufficient to determine a unique transformation, a list of all possible transformations will be computed.

(d) **inconsistency:** if no consistent transformation can be computed based on the sampled data (within a predefined degree of clutter), it'll be tested whether a single error in measurement is responsible for that.

Cases in which three or more characteristic points are measured can easily be solved using methods based on the landmark approach. For that reason the first phase of the project concentrates on cases with two characteristic points.

- Research Project Strukturen für geometrische Muster (Structures for geometric patterns)
  financially supported by the German Science Foundation (DFG)

Participating scientists:	Helmut Alt (project leader) Christian Knauer
Duration of the program:	October 2005 - September 2007

Search structures for geometric patterns

The main problem of geometric pattern recognition can be formalized in the following way: given two geometric objects (like, e.g., polygonal chains) called patterns, we wish to determine how similar they are. Here, the similarity of these patterns is measured with an adequate distance function (like, e.g., the Hausdorff-distance). Moreover, it usually is allowed that one of the objects undergoes a transformation from some class of geometric mappings (e.g., translations, or rotations) to make it as similar to the other object as possible.

In many applications we are faced with a variant of this problem, where we want to find one pattern out of a (possibly huge) set of geometric patterns (called the database) which is most similar to a given query pattern (again the query pattern may be allowed to undergo transformations to match the entries of the database). If the database is big, it is not feasible to compare the query pattern with all entries of the database separately. Instead we want to preprocess the patterns of the database and build a search structure to answer a query quickly.

The importance of this problem has spawned a multitude of commercial and academic so-called "Image-Retrieval-Systems" (IRS) which where developed in the last 10 years, like, e.g., the QBIC System from IBM, the Princeton 3D Models Search Engine, PicHunter, Blobworld, or the ASSERT System. Unfortunately, none of these systems solves the problem satisfactorily, let alone is it able to imitate, or compete with human perception. One of the reasons for this seems to be the fact that none of these systems directly uses the geometric shape of the objects to assess their similarity. Instead, most of them use simpler properties like color, texture, area, etc., and apply attribute based shape retrieval techniques.

In this project we investigate how methods from computational geometry and geometric pattern recognition can be applied to design efficient search structures for geometric patterns. The main focus is to design efficient algorithms for the problems at hand. It is also planned to implement some of the these algorithms and to test them on real data. In particular, the new methods will be compared to each other and with already existing systems and solutions.

- Measuring the Similarity of Geometric Graphs
  This is a joint project with Professor Otfried Cheong from the Korea Advanced Institute of Science and Technology (KAIST) in Daejeon, South Korea, financially supported by the German Science Foundation (DFG) and Korea Science & Engineering Foundation (KOSEF).

Participating scientists:	Christian Knauer
	Otfried Cheong (KAIST)

  Computational geometry has studied the matching and analysis of geometric shapes from a theoretical perspective, and developed efficient algorithms measuring the *similarity* of geometric objects. Two objects are similar if they do not differ much geometrically.

We propose to extend and generalize this work to a model where patterns are considered geometric graphs (= planar graphs together with a straight line embedding), and to develop algorithms measuring the similarity of geometric graphs. This will have to take into account not only the geometry of the shapes, but also their topological or combinatorial structure. Such a model captures some practical pattern recognition problems better than a purely geometric definition—recognizing logos, Egyptian hieroglyphics, Chinese characters, or electronic components in a circuit diagram are typical examples where this is the case.

The goal of the proposed research is to give suitable definitions for the similarity of geometric graphs and to find asymptotically efficient algorithms measuring the similarity of two given geometric graphs. A long term perspective is to also design data structures for storing large sets of geometric graphs such that the one most closely matching a given graph can be retrieved quickly.

4. Publications and Lectures

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

H. Alt, O. Cheong, A. Vigneron. *The Voronoi diagram of curved objects.* Discrete & Computational Geometry, Volume 34, Pages 439-453, 2005.

T. Lenz, G. Rote, Y.-J. Chiang, X. Lu. *Simple and optimal output-sensitive construction of contour trees using monotone paths.* Computational Geometry, Theory and Applications, Volume 30, Pages 165–195, 2005.

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.* Computational Geometry, Theory and Applications, 2005.

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

H. Alt, M. Buchin. *Semi-Computability of the Fréchet Distance between Surfaces.* Ed. J. Pach, In Proceedings of the 21st European Workshop on Computational Geometry (EWCG), Pages 45 – 48, Eindhoven, Netherlands, 2005.

H. Alt, L. Scharf. *Computing the Hausdorff Distance between Curved Objects.* In Proceedings of the 2nd International Symposium on Voronoi Diagrams in Science and Engineering, VD 05, Pages 196-204, Hanyang University, Seoul, Korea, October 2005.

K. Buchin. *Constructing Delaunay Triangulations along Space-Filling Curves.* In Proceedings of the 2nd International Symposium on Voronoi Diagrams in Science and Engineering, VD 05) Pages 184 – 195, Hanyang University, Seoul, Korea, October 2005.

K. Buchin. *Incremental Construction along Space-filling Curves.* In Proceedings of the 21st European Workshop on Computational Geometry (EWCG), Pages 17 – 20, Eindhoven, Netherlands, 2005.

K. Buchin, J. Giesen. *Flow Complex: General Structure and Algorithm.* In

Proceedings of the 17th Canadian Conference on Computational Geometry (CCCG), Pages 279 – 282, Windsor, Canada, 2005.

K. Buchin, M. Buchin, C. Wenk. *Fréchet Distance between Simple Polygons.* In Proceedings 15th Annual Fall Workshop on Computational Geometry, Pages 7 – 8, 2005.

M. Buchin, J. Giesen. *Minimizing the Total Absolute Gaussian Curvature in a Terrain is Hard.* In Proceedings of the 17th Canadian Conference on Computational Geometry (CCCG), Pages 192 – 195, Windsor, Canada, 2005.

D. Dimitrov, C. Knauer, K. Kriegel. *Matching surfaces with characteristic points.* In Proceedings of the 21st European Workshop on Computational Geometry (EWCG), Eindhoven, Netherlands, 2005.

P. Giannopoulos, M. Farshi, J. Gudmundsson. *Finding the Best Shortcut in a Geometric Network.* In 21st Annual ACM Symposium on Computational Geometry (SoCG), Pages to appear, Pisa, Italy, June 2005.

P. Giannopoulos, C. Knauer, G. Rote, S. Cabello. *Matching point sets with respect to the Earth Mover's distance.* In Proceedings of the 21st European Workshop on Computational Geometry (EWCG), Eindhoven, Netherlands, Pages 27–60, 2005.

P. Giannopoulos, C. Knauer, G. Rote, S. Cabello. *Matching point sets with respect to the Earth Mover's distance.* In Proceedings of the 13th Annual European Symposium on Algorithms (ESA), Ibiza, Spain, 2005.

O. Klein, R. C. Veltkamp. *Approximation Algorithms for the Earth Mover's Distance Under Transformations Using Reference Points.* In Proceedings of the 21st European Workshop on Computational Geometry (EWCG), Pages 53 - 56, Eindhoven, Netherlands, 2005.

O. Klein, R. C. Veltkamp. *Approximation Algorithms for Computing the Earth Mover's Distance Under Transformations.* In Proceedings of the 16th Annual Symposium on Algorithms and Computation (ISAAC), Sanya, Hainan, China, 2005.

C. Knauer, A. Ebbers-Baumann, A. Grüne, R. Klein, M. Karpinski, A. Lingas. *Embedding point sets into plane graphs of small dilation.* In Proceedings of the 16th Annual International Symposium on Algorithms and Computation (ISAAC), Hainan, China, Pages 5–16, 2005.

C. Knauer, R. Klein, G. Narasimhan, M. Smid. *Exact and approximation algorithms for computing the dilation spectrum of paths, trees and cycles.* In Proceedings of the 16th Annual International Symposium on Algorithms and Computation (ISAAC), Hainan, China, Pages 849–858, 2005.

C. Knauer, E. Schramm, A. Spillner, A. Wolff. *Configurations with few crossings in topological graphs..* Proceedings of the 16th Annual International Symposium on Algorithms and Computation (ISAAC), Hainan, China, Pages 604-613, 2005.

C. Knauer, W. Mulzer. *An exclusion region for minimum dilation triangulations.* In Proceedings of the 21st European Workshop on Computational Geometry

(EWCG), Eindhoven, Netherlands, 2005.

C. Knauer, E. Schramm, A. Spillner, A. Wolff. *Spanning trees with few crossings in geometric graphs (Extended Abstract).* In Proceedings of the 21st European Workshop on Computational Geometry (EWCG), Eindhoven, Netherlands, 2005.

T. Lenz. *Reconstructing Collections of Arbitrary Curves.* In 21st Annual ACM Symposium on Computational Geometry (SoCG), Pisa, Italy, June 2005.

G. Rote. *Strictly convex drawings of planar graphs.* In Proceedings of the 16th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), Vancouver, 2005.

(c) Other Publications

O. Klein, R. C. Veltkamp. *Approximation Algorithms for the Earth Mover's Distance Under Transformations Using Reference Points.* Technical Report UU-CS-2005-003, Department of Information and Computing Sciences, Universiteit Utrecht, 2005.

C. Knauer, E. Moet, M. van Kreveld. *Visibility maps of segments and triangles in 3d.* Technical Report UU-CS-2005-049, Institute of Information and Computing Sciences, Universiteit Utrecht, 2005.

C. Knauer, A. Wolff, E. Schramm, A. Spillner. *Configurations with few crossings in topological.* Technical Report 2005-24, Fakultät für Informatik, Universität Karlsruhe, 2005.

G. Rote. *Computing the Fréchet distance between piecewise smooth curves.* Technical Report ECG-TR-241108-01, Pages 13, May 2005.

C. Knauer, A. Wolff, E. Schramm, A. Spillner. *Configurations with few crossings in topological.* Technical Report 2005-24, Fakultät für Informatik, Universität Karlsruhe, 2005.

S. Scholz. *Kalibrierung von elektromagnetischen Navigationssensoren.* Diplom-/Masterarbeit, Institut für Informatik, Freie Universität Berlin, 2005.

(d) Technical Reports

B 05-02 T. Lenz. *Simple Reconstruction of Non-Simple Curves.*

B-05-05, C. Knauer, G. Rote. *Shortest Inspection-Path Queries in Simple Polygons.*

B-05-06 C. Knauer, W. Mulzer. *Minimum Dilation Triangulations.*

B 05-11 O. Klein, R. C. Veltkamp. *Approximation Algorithms for the Earth Mover's Distance Under Transformations Using Reference Points.*

B 05-16 C. Knauer, J. Gudmundsson. *Dilation and Detours in Geometric Networks.*

B 05-23 W. Mulzer, G. Rote. *Minimum Weight Triangulation is NP-Hard.*

(e) Lectures/Talks

Helmut Alt

- *Can we compute the Fréchet distance between surfaces?*, Seminar Computational Geometry, IBFI Schloss Dagstuhl, March 14th - 18th.
- *The Fréchet Distance for Measuring the Similarity of Shapes*, COMBSTRU-Workshop, Oxford University April 12th.
- *Computing the Hausdorff distance between curved objects*, International Symposium on Voronoi diagrams in Science and Engineering 2005, Seoul, Korea, October 11th.
- *Probabilistic Matching of Shapes*, Seminar, Theoretical Computer Science Lab, Korea Advanced Institute of Science and Technology (KAIST), Daejon, Korea, October 21st.

Kevin Buchin

- *Incremental Construction along Space-filling Curves*, 21st European Workshop on Computational Geometry in Eindhoven, the Netherlands, March 9th.
- *Incremental Construction along Space-Filling Curves*, Noon Seminar of the Theory of Combinatorial Algorithms Group at the ETH Zurich, April 7th.
- *The Flow Complex: General Structure and Algorithm*, Noon Seminar of the Theory of Combinatorial Algorithms Group at the ETH Zurich, July 8th.
- *The Flow Complex: General Structure and Algorithm*, Colloquium of the graduate program Combinatorics, Geometry and Computation, at the Technische Universität Berlin, July 11th.
- *Flow Complex: General Structure and Algorithm*, 17th Canadian Conference on Computational Geometry in Windsor, Canada, August 12th.
- *A New Randomized Algorithm for Fast Delaunay Mesh Generation*, Colloquium of the Computer Science Department of the University of Texas at San Antonio, August 26th.
- *The Flow Complex: General Structure and Algorithm*, Noon Seminar of the Theory of Combinatorial Algorithms Group at the ETH Zurich, July 8th.
- *On Biased Randomized Incremental Construction*, 5th Workshop on Combinatorics, Geometry, and Computation on Hiddensee, September 27th.
- *Constructing Delaunay Triangulations along Space-Filling Curves*, 2nd International Symposium on Voronoi Diagrams in Science and Engineering, October 12th.
- *Topology Control for Ad Hoc Networks (2)*, GI-Dagstuhl Research Seminar on Algorithms for Sensor and Ad Hoc Networks, November 23rd - 25th.

Maike Buchin

- *Semi-Computability of the Fréchet Distance between Surfaces* 21st European Workshop on Computational Geometry in Eindhoven, the Netherlands, March 9th.
- *Semi-Computability of the Fréchet Distance between Surfaces*, Noon Seminar of the Theory of Combinatorial Algorithms Group at the ETH Zurich, April 12th.
- *Minimizing the Total Absolute Gaussian Curvature in a Terrain is Hard* Col-

loquium of the graduate program *Combinatorics, Geometry, and Computation*, Technische Universität Berlin, June 13th.
- *Minimizing the Total Absolute Gaussian Curvature in a Terrain is Hard*, Noon Seminar of the Theory of Combinatorial Algorithms Group at the ETH Zurich, July 8th.
- *Minimizing the Total Absolute Gaussian Curvature in a Terrain is Hard* 17th Canadian Conference on Computational Geometry in Windsor, Canada, August 10th through 12th.
- *Comparing Geometric Shapes using the Fréchet Distance*, Colloquium of the Computer Science Department of the University of Texas at San Antonio, August 26th.
- *Fréchet Distance of Curves and Surfaces* 5th Workshop on Combinatorics, Geometry, and Computation on Hiddensee, September 25th - 28th.
- *Topology Control for Ad Hoc Networks*, GI-Dagstuhl Research Seminar on Algorithms for Sensor and Ad Hoc Networks, November 23rd - 25th.

Darko Dimitrov
- *Matching surfaces with characteristic points*, 21th European Workshop on Computational Geometry (EWCG), Eindhoven, the Netherlands.

Christian Knauer
- *Planar spanning trees with few crossings in geometric and topological graphs*, Dagstuhl, March 14th.
- *Entwurf und Bewertung geometrischer Netzwerke*, Antrittsvolesung, Freie Universität Berlin, June 3rd.

Tobias Lenz
- *Reconstructing Collections of Arbitrary Curves*, 21st Annual Symposium on Computational Geometry (SoCG), National Research Council of Italy (CNR), Pisa, June 6th - 8th.
- *A New Approach to Curve Reconstruction*, 33. Berliner Algorithmen Tag (BAT), Freie Universität Berlin, July 15th.

Günter Rote
- *Strictly convex drawings of planar graphs*, 16th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), Vancouver, January 23rd - 25th.
- *On the exact solution of the L_1 circle fitting problem*, Computational Geometry, Internationales Begegnungs- und Forschungszentrum für Informatik, Schloss Dagstuhl, March 14th - 18th.
- *The number of spanning trees in a planar graph*, Discrete Geometry. Oberwolfach, April 10th - 16th.
- *Strictly convex drawings of planar graphs*, 2nd Joint Meeting of AMS, DMV, and ÖMG , June 16th - 19th.
- *Pseudotriangulations*, 6th Max-Planck Advanced Course on the Foundations of Computer Science (ADFOCS), Saarbrücken, August 29th - 2nd.
- *Counting polyominoes on twisted cylinders*, EuroComb'05, European Conference on Combinatorics, Graph Theory and Applications, Berlin, September 5th - 9th.

- *Robust geometric intersection by the Unsubdivision Method*, ACS—Algorithms for Complex Shapes, kickoff meeting, Zürich, September 20th - 24th.
- *Counting polyominoes on twisted cylinders*, Department of Computer Science, École Normale Supérieure, Paris, September 27th.
- *Strictly convex drawings of planar graphs*, Department of Computer Science, École Normale Supérieure, Paris, October 4th.
- *Pseudotriangulations and the expansion polytope*, Séminaire Combinatoire Algébrique et Géométrique, Université Pierre et Marie Curie, Paris, October 13th.

Ludmila Scharf

- *Data Gathering in Sensor Networks*, GI-Dagstuhl Research Seminar Algorithms for Sensor and Ad Hoc Networks, Schloss Dagstuhl, November 23rd - 25th.

Andre Schulz

- *A Pointed Delaunay Pseudo-Triangulation of a Simple Polygon* 21st European Workshop on Computational Geometry, Eindhoven, the Netherlands, March 10th.
- *New results on Pseudo-triangulations with low vertex degree*, 17th Canadian Conference on Computational Geometry, Windsor, Canada, August 11th.

5. Courses, Seminars, Exercises and Laboratories (WS 04/05 and SS 05)

H. Alt, G Rote, and other lecturers of the graduate program, *Lectures of the graduate program* Combinatorics, Geometry, and Computation, (winter semester 04/05).

H. Alt, *Computer-Sehen (computer vision)*, course and exercises, (winter semester 04/05).

F. Hoffmann, *Brückenkurs Mathematische Grundlagen für Bioinformatik und Nebenfach Informatik (Mathematical foundations for Bioinformatics and Computer Science Minors)*, course and exercises, (winter semester 04/05).

F. Hoffmann, *Mathematik für Informatiker III (Mathematics for computer scientists III)*, course and exercises, (winter semester 04/05).

I. Izmestiev, *Diskrete Geometrie (discrete geometry)*, course and exercises, (winter semester 04/05).

C. Knauer, *Entwurf und Analyse von Algorithmen (design and analysis of algorithms)*, course and exercises, (winter semester 04/05).

K. Kriegel, *Mathematik für Informatiker I (Schülerkurs] (mathmatics for computer scientists I - pupil course)*, course and exercises, (winter semester 04/05).

K. Kriegel, *Informatik A*, course and exercises, (winter semester 04/05).

G. Rote, *Algorithmen zum Aufzählen und Abzählen (algorithms to enumerate and counting)*, course and exercises, (winter semester 04/05).

G. Rote, *Kombinatorische Optimierung (combinatoric optimization)*, course and exercises, (winter semester 04/05).

A. Srivastav, *Advanced Probabilistic Methods*, course and exercises, (winter semester 04/05).

H. Alt, C. Knauer, 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 04/05).

H. Alt, *Seminar über Komplexitätstheorie (complexity theory)*, seminar, (winter semester 04/05).

C. Knauer, *Theoretische Informatik (theoretical computer science)*, seminar, (winter semester 04/05).

T. Lenz, R. Rote, Praktikum *über Computergrafik (computer graphics)*, seminar, (winter semester 04/05).

H. Alt, G. Rote, and other lecturers of the graduate program, *Colloquium of the graduate program* Combinatorics, Geometry, and Computation, colloquium, (winter semester 04/05).

H. Alt, G. Rote, and other lecturers of the graduate program, *Lectures of the graduate program* Combinatorics, Geometry, and Computation, (summer semester 05).

H. Alt, *Algorithmische Geometrie (Computational Geometry)*, course and exercises, (summer semester 05).

F. Hoffmann, *Informatik B)*, course and exercises, (summer semester 05).

C. Knauer, *Approximationsalgorithmen (approximation algorithms)*, course and exercises, (summer semester 05).

K. Kriegel, *Mathematik für Informatiker II (Mathematics for computer scientists II)*, course and exercises, (summer semester 05).

R. Rote, *Grundlagen der Theoretischen Informatik (basics of theoretical computer science)*, course and exercises, (summer semester 05).

H. Alt, C. Knauer, 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 05).

H. Alt, *Seminar über Algorithmen (Seminar about algorithms)*, seminar, (summer semester 05).

F. Hoffmann, *Average-Case-Analyse von Algorithmen auf Sequenzen (average-case-analysis of algorithms on sequences*, seminar, (summer semester 05).

G. Rote, *Seminar über algorithmische und kombinatorische Geometrie (Pseudotriangulierungen) (algorithmic and combinatorial geometry (pseudotriangulations)*, seminar, (summer semester 05).

H. Alt, L. Scharf, *Praktikum zum Computer-Sehen (laboratory to computer vision)*, (summer semester 05).

C. Knauer, T Lenz, G. Rote, *Praktikum Implementierung effizienter Algorithmen und Datenstrukturen (laboratory to implementation or efficient algorithms and data structures)*, (summer semester 05).

H. Alt, G. Rote, and other lecturers of the graduate program, *Colloquium of the graduate program* Combinatorics, Geometry, and Computation, colloquium, (summer semester 05).

6. **Organisation of scientific events**

Seminar on computational geometry, Internationales Begegnungs- und Forschungszentrum für Informatik, IBFI Schloss Dagstuhl, March 14th - 18th.
Organization: H. Alt, F. Aurenhammer, D. Halperin.

Berliner Algorithmen-Tag (BAT), Freie Universtiät Berlin, July 15th.
Organization: H. Alt.

7. **Diplomas**

Robert Günzler.
Phantom-basierte Navigation in intra-operativ akquirierten Fluroskopiebildern
(Phantom-based navigation in fluorescopy images aquired during surgery)
Supervisor: Christian Knauer.

Oliver Kania.
Matching Geometric Graphs
Supervisor: Helmut Alt.

Christian Paul.
Numerische Experimente zum Kreisproblem von Gauß
(Numerical experiments on the circle problem by Gauß)
Supervisor: Günter Rote.

Sven Scholz.
Kalibrierung von elektromagnetischen Navigationssensoren
(Calibration of electromagnetic navigation sensors)
Supervisor: Christian Knauer.

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.
- Chairman of the teaching assistant selection committee at the Computer Science Institute, Freie Universität Berlin.

- Member of the directorial board of *GIBU* (GI council of university professors).
- Member of the Ph.D. committees of:

  Mirela Tanase, University of Utrecht

  Panagiotis Giannopoulos, University of Utrecht

  Mohammad Ghasemzadeh, Hasso-Plattner-Institut, Universität Potsdam
- Member of the program committee *International Conference on Shape Modeling and Applications (SMI 05)*
- Member of the jury of the final round of "Bundeswettbewerb Informatik" (federal computer science competition for high school students)
- Referee for DFG - Deutsche Forschungsgemeinschaft (German Science Foundation)
- Referee for various journals and conferences
- Research stay at the Division of Computer Science, Korea Advanced Institute of Science and Technology, with Prof. Dr. Otfried Cheong, October 1st - December 24th.

Kevin Buchin

- Research stay at the Theory of Combinatorial Algorithms Group at the ETH Zurich with Prof. Dr. Emo Welzl and Dr. Joachim Giesen, January 31st - 13th.
- Research stay at the Theory of Combinatorial Algorithms Group at the ETH Zurich with Prof. Dr. Emo Welzl and Dr. Joachim Giesen, July 4th - 8th.
- Research stay at the Computer Science Department of the University of Texas at San Antonio with Dr. Carola Wenk, August 15th - 26th.

Maike Buchin

- Research stay at the Theory of Combinatorial Algorithms Group at the ETH Zurich with Prof. Dr. Emo Welzl and Dr. Joachim Giesen, January 31st - 13th.
- Research stay at the Theory of Combinatorial Algorithms Group at the ETH Zurich with Prof. Dr. Emo Welzl and Dr. Joachim Giesen, July 4th - 8th.
- Research stay at the Computer Science Department of the University of Texas at San Antonio with Dr. Carola Wenk, August 15th - 26th.

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.
- Referee for *SIAM Journal on Computing*.
- Referee for *International Journal Computational Geometry and Applications*.
- Referee for *SoCG 2005*.
- Referee for *EuroComb 2005*.

Oliver Klein

- Research stay at Universiteit Utrecht, Institute of Information and Computing Science, Center for GIVE, Workgroup of Prof. Dr. Mark Overmars, Supervisor Dr. Remco Veltkamp, October 2004 - March, 2005

Christian Knauer

- Member of the departmental council (Fachbereichssrat) of mathmatics and computer science, Freie Universität Berlin.
- Member of the institute council (Institutsrat) of computer science, Freie Universität Berlin.
- Managing director of the institute of computer science, Freie Universität Berlin.
- Project leader of the research project "Punktregistrierung in Flächen (Point registration in surfaces)" (together with Klaus Kriegel).
- Supervisor of the student research project "Planare Rekonfiguration nicht-einfacher Mechanismen (Planar reconfiguration of non-simple mechanisms" from Rasmus Krause.
- Supervisor of the student research project "Über das Lösen von Nonogrammen (About solving nono-grams)" from Yvonne Schindler.
- Supervisor of the student research project "Implementierung der randomisiert inkrementellen Konstruktion der ebenen Trapezzerlegung (Implementation of the randomized incremental construction of trapezoid decomposition in the plane)" from Fabian Stehn.
- Referee for the internship of Sven Scholz.
- Referee for the diploma thesis of Robert Günzler.
- Referee for the diploma thesis of Sven Scholz.
- Referee for *SoCG 2005*.
- Referee for *WADS 2005*.
- Referee for *COCOON 2005*.
- Referee for *ESA 2005*.
- Referee for *Eurocomb 2005*.
- Referee for *IJCGA*.
- Referee for *CGTA*.
- Referee for *WAOA 2005*.
- Referee for *STACS 2006*.
- Referee for *SoCG 2006*.
- Referee for the*Cusanuswerk*.

Klaus Kriegel

- Member of the teaching assistant selection committee.
- Project leader of the research project "Punktregistrierung in Flächen (Point registration in surfaces)" (together with Christian Knauer).

Tobias Lenz

- Member of the institute council (Institutsrat) of computer science, Freie Universität Berlin.
- Member of the teaching assistant selection committee.
- Referee for *SoCG 2005*.

Günter Rote

- Chairman of program committee for 21st Annual Symposium on Computational Geometry (SoCG), Pisa, June 2005.

- Coordinator of the Erasmus/Socrates student exchange program for the departments of mathematics and computer science.
- Supervisor and reviewer of the Ph.D. thesis of for Ares Ribó, chairman of the committee.
- Member of examination committee for Computer Science, deputy chairman in charge of M.Sc. admissions.
- Reviewer for the Ph.D. dissertation of Jean-Pierre Técourt (INRIA Nice–Sophia Antipolis).
- Referee for the Conferences:
  ESA 2005, European Symposium on Algorithms.
  STOC 2005, 37th ACM Symposium on Theory of Computing November 2005, Baltimore.
  SODA 2005, ACM-SIAM Symposium on Discrete Algorithms, January 2005, Vancouver.
- Referee for the journals:
  Mathematical Programming, Applied Mathematics Letters, Discrete Mathematics, Discrete Optimization, Discrete and Computational Geometry.
- Visiting scientist at the Department of Computer Science, École Normale Supérieure, Paris, September 12th through October 14th.

Ludmila Scharf

- Referee for *SoCG'05*.

Appendix:

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

January 4: Klaus Kriegel
On compact representations of visibility graphs II

January 6: Peter Brass
On Lebesgue's Universal Cover Problem

January 11: Andre Schulz
A pointed Delaunay Pseudo-Triangulation of a simple Polygon

January 13: Panos Giannopoulos
Matching point sets with respect to the Earth Mover's Distance

January 18: Philippe Guigue
Inner and Outer Rounding of Set Operations on Lattice Polygonal Regions

January 20: Anand Srivastav
Geometric Discrepancy in R^d and Covers

January 25: Helmut Alt
On the computability of real-valued functions

January 27: Christian Knauer
Planar spanning trees with few crossings in geometric and topological graphs February

01: Hosam Abdo
Graph of Triangulations of a Convex Polygon and Tree of Triangulations

February 03: Günter Rote
Low Distortion Embedding Between Pointsets

February 08: Frank Hoffmann
Matrix Rounding with Low Error

February 10: Britta Broser
The Tracing Problem and Continuation Methods

February 15: Ludmila Scharf
Discrete Average Distance for Parametric Curves

February 17: Esther Moet
The Visibility Map of an Edge in 3D Scenes

February 22: Darko Dimitrov
Approximation algorithm for low-distortion embeddings into one-dimensional space

February 24: Wolfgang Mulzer
Sorting optimally and stably

March 1: Britta Broser
The Tracing Problem and Continuation Methods

March 3: Therese Biedl, University of Waterloo
The complexity of orthogonal octagonal cartograms

March 8: Helmut Alt
The carrot problem

March 15: Klaus Kriegel
New crossing numbers of complete graphs

March 17: André Schulz
Flipping Pseudotriangulation to Optimality

March 22: Tobias Lenz
ApproximatingContour Trees in Linear Time

March 24: Christian Knauer
The fastest way to see a query point in a simple polygon

March 31: Frank Hoffmann
Computing maximally separated point sets in the plane

April 5: Günter Rote
Intersections of Bezier curves

April 7: Oliver Klein
Approximation Algorithms for the Earth Mover's Distance Under Transformations Using Reference Points

April 12: Wolfgang Mulzer
An exclusion region for the minimum dilation triangulation

April 14: Ludmila Scharf
Dynamic time warping

April 19: Darko Dimitrov
Principal component analysis and reflective symmetry

April 21: Marc Glisse
On the size of silhouettes of polyeders

April 26: Jeff Erickson
Empty Ellipse Graphs

April 28: Sven Scholz
Calibration of surgical navigation tools

May 3: Laura Heinrich-Litan
Rectangle Covers

May 10: Helmut Alt
Why is the sky dark at night?

May 12: Tzvetalin Vassilev
Optimal Area Triangulations, part 2

May 17: Klaus Kriegel
Grid drawings of k-colourable graphs

May 19: Günter Rote
Strictly convex drawings of planar graphs

May 24: Tzvetalin Vassilev
Shortest paths in geometric graphs
May 26: Tobias Lenz
Increasing Epsilon

May 31: Britta Denner-Broser
Dynamic Geometry: Geometry vs. Algebra

June 2: André Schulz
Constructing Pseudo-triangulations with edge and vertex degree constraints is NP-complete

June 7: Kevin Buchin
Tropical Mathematics

June 9: Otfried Cheong
Small graphs with small dilation

June 10: Mohammad Ghasemzadeh
A New Algorithm for the Quantified Satisfiability Problem

June 14: Martin Kutz
Reachability Substitutes for Planar Digraphs

June 16: Peter Brass
Finding the maximum overlap of two families of triangles

June 21: Maike Buchin
Average Frechet Distance: Definitions which are not Metrics

June 23: Christian Knauer
Covering a bichromatic point set with two colored coins

June 28: Frank Hoffmann
Orthogonal Segment Stabbing

June 30: Oliver Klein
Minimizing the Earth Mover's Distance Under Rigid Motions

July 5: Ludmila Scharf
Stability of persistence diagrams

July 7: Darko Dimitrov
An application of Davenport-Schinzel sequences

July 12: Wolfgang Mulzer
Minimum Weight Triangulation

July 14: Helmut Alt
More News About Watering Carrots

July 19: Andreas Spillner
Minimum Weight Triangulation and Optimal Convex Partition of Point Sets with Few Inner Points

July 21: Klaus Kriegel
Geometric Approaches for Leaf Sequencing Problems

August 2: Tobias Lenz
About finding a splitter in a stream with constant memory

August 4: Sven Scholz
The Visibility-Voronoi Complex and its Applications

August 9: Günter Rote
The number of primitive vectors in large areas

August 11: Hosam Abdo
Products of Two Simplices

August 16: Oliver Klein
Approximation of the Monge-Kantorovich Distance Under Translations

August 18: Ludmila Scharf
Gathering Correlated Data in Sensor Networks

August 23: André Schulz
Directing the pointedness

August 25: Frank Hoffmann
A Representation Result for Plane Bipartite Graphs

August 30: Darko Dimitrov
Matching surfaces with characteristic points: the one point case

September 1: Helmut Alt
Analytic Approaches for Shape Matching

September 13: Christian Knauer
Minimum Convex Partitions of Point Sets

September 15: Maike Buchin
Computing the Frechet Distance Between Simple Polygons

September 20: Klaus Kriegel
Non-stretchable pseudo-visibility graphs

September 22: Kevin Buchin
On the Delaunay triangulation of normally distributed points

September 27: Sven Scholz
Heuristics for Matching Sets of Polylines

September 29: Esther Moet
Smallest Intersectng Circle for a Set of Polygons

October 4: Tobias Lenz
Object Extraction From Images Using Color Clustering - A Practical Approach

October 6: Scot Drysdale
The Rectilinear Minimum Link-Distance Problem in Three Dimensions

October 11: Astrid Sturm
Biarcs

October 13: Britta Denner-Broser
General Properties of Dynamic Geometry Systems

October 18: Guenter Rote
Point conficurations and monotone pseudoline arrangements

October 20: Oliver Klein
Approximation Algorithms for the Monge-Kantorovich Distance Under Translations

October 25: André Schulz
Testing the Laman Property with Pebbles

October 27: Frank Hoffmann
Morphing Orthogonal Planar Graph Drawings

November 1: Darko Dimitrov
Minimum-Volume Bounding Box

November 3: Adam Trepczynski
Schnittmodellierung auf triangulierten Polygonoberflächen

November 8: Ludmila Scharf
Shallow Light Tree

November 10: Hosam Abdo
Multistage insertion relaxation for STSP

November 15: Maike Buchin
Cone based Topology Control in Ad Hoc Networks

November 17: Kevin Buchin
Delaunay and Neighbor based Topology Control in Ad Hoc Networks

November 22: Christian Knauer
Approximating the intersection diameter of polygons

November 24: Sven Scholz
A Heuristic for Matching Sets of Polylines - now for real

December 6: Riste Skrekovski
Two Extensions of Kotizig's Theorem

December 8: Günter Rote
Shortest triangulation is NP-hard

December 13: Eyal Ackerman
On the geometric thickness of bounded-degree graphs

December 15: Christian Knauer
Approximating the intersection diameter of polygons again

December 20: Astrid Sturm
Circular Ray Shooting

December 22: André Schulz
A new Proof of the NP-completeness of the Triangulation Existence Problem