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CITIZENSHIP Germany

RESEARCH INTERESTS

- Computational geometry
- Data structures
- Low-entropy input models
- Optimal triangulations

Most of my work is in the field of computational geometry, where I explore how additional structure in the inputs can be exploited to find faster algorithms for classical problems, like Delaunay triangulation and convex hull computation. Such additional structure may come in the form of bounded precision, information about the likely location of the input points, or the fact that the input points are sampled from a low-entropy distribution or come from a relatively small set of candidates. In earlier work, I considered triangulations, and helped settle the complexity status of the notorious minimum weight triangulation problem by showing that it is NP-hard.

EMPLOYMENT **Freie Universität Berlin**, Berlin, Germany

Professor, Computer Science, since October 2016

Juniorprofessor, Computer Science, November 2010–September 2016

Visiting Professor, Computer Science, October 2010

EDUCATION **Princeton University**, Princeton, NJ, USA

PhD, Computer Science (2005 – 2010)

- Advisor: Prof. Dr. Bernard Chazelle
- Thesis topic: *Low-Entropy Computational Geometry*
- Degree conferred in June 2010

MA., Computer Science, September 2007

Freie Universität Berlin, Berlin, Germany

Research Assistant, Computer Science (2004 – 2005)

- Advisor: Prof. Dr. Günter Rote
- Research topic: *Optimal Triangulations*

Diplom, Computer Science (2000 – 2004)

- Advisor: Prof. Dr. Christian Knauer
- Thesis topic: *Minimum Dilation Triangulations for the Regular n -gon*
- Degree conferred in November 2004

HONORS Recipient of a starting grant from the European Research Council (ERC), September 2017

Participated in the first Heidelberg Laureate Forum, September 2013

Wallace Memorial Fellowship in Engineering

- Princeton University Honorific fellowship (2009 – 2010)

Studienstiftung des deutschen Volkes (German Academic Foundation)

- Scholarship (2003 – 2004)

Fulbright Travel Grant

- Exchange scholarship to Princeton University (2003 – 2004)

Freie Universität Berlin Exchange Scholarship

- Exchange scholarship to Princeton University (2003 – 2004)

SURVEYS

Five Proofs of Chernoff’s Bound with Applications

W. Mulzer

Bulletin of the EATCS (BEATCS), 124, February 2018.

Proximity Algorithms

J. S. Mitchell and W. Mulzer

In: Jacob E. Goodman, Joseph O’Rourke, and Csaba D. Tóth (editors), Handbook of Discrete and Computational Geometry, Third Edition, Chapter 32, 2017, pp. 849–874.

Encoding Arguments

P. Morin, W. Mulzer, and T. Reddad

ACM Computing Surveys (CSUR), 50(3), July 2017, Article 46.

JOURNAL PUBLICATIONS

Computational Aspects of the Colorful Carathéodory Theorem

W. Mulzer and Y. Stein

Discrete and Computational Geometry (DCG), to appear.

Time-Space Trade-offs for Triangulations and Voronoi Diagrams

M. Korman, W. Mulzer, A. van Renssen, M. Roeloffzen, P. Seiferth, and Y. Stein
Computational Geometry: Theory and Applications (CGTA), to appear.
Special issue on EWCG 2015.

Routing in Unit Disk Graphs

H. Kaplan, W. Mulzer, L. Roditty, and P. Seiferth

Algorithmica, 80(3), 2018, pp. 830–848.

Special issue on LATIN 2016.

The Dual Diameter of Triangulations

M. Korman, S. Langerman, W. Mulzer, A. Pilz, M. Saumell, and B. Vogtenhuber

Computational Geometry: Theory and Applications (CGTA), 68, 2018, pp. 243–252.

Special issue in memory of Ferran Hurtado.

An Optimal Algorithm for Reconstructing Point Set Order Types from Radial Orderings

O. Aichholzer, V. Kusters, W. Mulzer, A. Pilz, and M. Wettstein

International Journal of Computational Geometry and Applications (IJCGA), 27(1n2), 2017, pp. 57–83.

Special issue on ISAAC 2015.

Four Soviets Walk the Dog: Improved Bounds for Computing the Fréchet Distance

K. Buchin, M. Buchin, W. Meulemans, and W. Mulzer

Discrete and Computational Geometry (DCG), 58(1), July 2017, pp. 180–216.

Computing the Fréchet Distance with a Retractable Leash

K. Buchin, M. Buchin, R. van Leusden, W. Meulemans, and W. Mulzer
Discrete and Computational Geometry (DCG), 56(2), September 2016, pp. 315–336.

Approximability of the Discrete Fréchet Distance

K. Bringmann and W. Mulzer
Journal of Computational Geometry (JoCG), 7(2), 2016, pp. 46–76.
Special issue on SoCG 2015.

Flip Distance Between Triangulations of a Simple Polygon is NP-Complete

O. Aichholzer, W. Mulzer, and A. Pilz
Discrete and Computational Geometry (DCG), 54(2), September 2015, pp. 368–389.

Data Structures on Event Graphs

B. Chazelle and W. Mulzer
Algorithmica, 71(4), 2015, pp. 1007–1020.

Algorithms for Tolerant Tverberg Partitions

W. Mulzer and Y. Stein
International Journal of Computational Geometry and Applications (IJCGA), 24(4),
2014, pp. 261–273.
Special issue on ISAAC 2013.

Reprint of: Memory-Constrained Algorithms for Simple Polygons

T. Asano, K. Buchin, M. Buchin, M. Korman, W. Mulzer, G. Rote, and A. Schulz
Computational Geometry: Theory and Applications (CGTA), 47(3), 2014, pp. 469–
479.
Special issue on EWCG 2012.

Self-Improving Algorithms for Coordinate-Wise Maxima and Convex Hulls

K. L. Clarkson, W. Mulzer, and C. Seshadhri
SIAM Journal on Computing (SICOMP), 43(2), 2014, pp. 617–653.

**Unions of Onions: Preprocessing Imprecise Points for Fast Onion De-
composition**

M. Löffler and W. Mulzer
Journal of Computational Geometry (JoCG), 5(1), 2014, pp. 1–13.

Approximating Tverberg Points in Linear Time for Any Fixed Dimension

W. Mulzer and D. Werner
Discrete and Computational Geometry (DCG), 50(2), September 2013, pp. 520–535.

Memory-Constrained Algorithms for Simple Polygons

T. Asano, K. Buchin, M. Buchin, M. Korman, W. Mulzer, G. Rote, and A. Schulz
Computational Geometry: Theory and Applications (CGTA), 46(8), 2013, pp. 959–
969.
Special issue on EWCG 2012.

**Convex Hull of Points Lying on Lines in $o(n \log n)$ Time after Preprocess-
ing**

E. Ezra and W. Mulzer
Computational Geometry: Theory and Applications (CGTA), 46(4), 2013, pp. 417–
434.
Special issue on SoCG 2011.

**A Static Optimality Transformation with Applications to Planar Point
Location**

J. Iacono and W. Mulzer

International Journal of Computational Geometry and Applications (IJCGA), 22(4), 2012, pp. 327–340.
Special issue on SoCG 2011.

Triangulating the Square and Squaring the Triangle: Quadtrees and Delaunay Triangulations are Equivalent

M. Löffler and W. Mulzer

SIAM Journal on Computing (SICOMP), 41(4), 2012, pp. 941–974.

Constant-Work-Space Algorithms for Shortest Paths in Trees and Simple Polygons

T. Asano, W. Mulzer, and Y. Wang

Journal of Graph Algorithms and Applications (JGAA), 15(5), 2011, pp. 569–586.
Special issue on WALCOM 2010.

Preprocessing Imprecise Points for Delaunay Triangulations: Simplified and Extended

K. Buchin, M. Löffler, P. Morin, and W. Mulzer

Algorithmica, 61(3), 2011, pp. 674–693.

Constant-Work-Space Algorithms for Geometric Problems

T. Asano, W. Mulzer, G. Rote, and Y. Wang

Journal of Computational Geometry (JoCG), 2(1), 2011, pp. 46–68.

Computing Hereditary Convex Structures

B. Chazelle and W. Mulzer

Discrete and Computational Geometry (DCG), 45(4), June 2011, pp. 796–823.
Special Issue on SoCG 2009.

Delaunay Triangulations in $O(\text{sort}(n))$ Time and More

K. Buchin and W. Mulzer

Journal of the Association for Computing Machinery (JACM), 58(2), April 2011, Article 6.

Self-Improving Algorithms

N. Ailon, B. Chazelle, K. L. Clarkson, D. Liu, W. Mulzer, and C. Seshadhri

SIAM Journal on Computing (SICOMP), 40(2), 2011, pp. 350–375.

Markov Incremental Constructions

B. Chazelle and W. Mulzer

Discrete and Computational Geometry (DCG), 42(3), October 2009, pp. 399–420.
Special Issue on SoCG 2008.

A Note on Predecessor Searching in the Pointer Machine Model

W. Mulzer

Information Processing Letters (IPL), 109(13), 2009, pp. 726–729.

Minimum Weight Triangulation is NP-hard

W. Mulzer and G. Rote

Journal of the Association for Computing Machinery (JACM), 55(2), May 2008, Article 11.

REFEREED
CONFERENCES

Time-Space Trade-Offs for Computing Euclidean Minimum Spanning Trees

B. Banyassady, L. Barba, and W. Mulzer

Proceedings of the 13th Latin American Theoretical Informatics Symposium (LATIN), Buenos Aires, Argentina, 2018, pp. 108–119.

Combinatorics of Beacon-based Routing in Three Dimensions

J. Cleve and W. Mulzer

Proceedings of the 13th Latin American Theoretical Informatics Symposium (LATIN), Buenos Aires, Argentina, 2018, pp. 346–360.

Recognizing Generalized Transmission Graphs of Line Segments and Circular Sectors

K. Klost and W. Mulzer

Proceedings of the 13th Latin American Theoretical Informatics Symposium (LATIN), Buenos Aires, Argentina, 2018, pp. 683–696.

Faster Algorithms for Growing Prioritized Disks and Rectangles

H. Ahn, S. W. Bae, J. Choi, M. Korman, W. Mulzer, E. Oh, J. Park, A. van Renssen, and A. Vigneron

Proceedings of the 28th International Symposium on Algorithms and Computation (ISAAC), Phuket, Thailand, 2017, pp. 3:1–3:13.

Invited to the special issue on ISAAC 2017 (IJCGA).

Routing in Polygonal Domains

B. Banyassady, M. Chiu, M. Korman, W. Mulzer, A. van Renssen, M. Roeloffzen, P. Seiferth, Y. Stein, B. Vogtenhuber, and M. Willert

Proceedings of the 28th International Symposium on Algorithms and Computation (ISAAC), Phuket, Thailand, 2017, pp. 10:1–10:13.

Invited to the special issue on ISAAC 2017 (IJCGA).

Delta-Fast Tries: Local Searches in Bounded Universes with Linear Space

M. Ehrhardt and W. Mulzer

Proceedings of the 15th Algorithms and Data Structures Symposium (WADS), St John's, Canada, 2017, pp. 361–372.

Time-Space Trade-off for Finding the k -Visibility Region of a Point in a Polygon

Y. Bahoo, B. Banyassady, P. Bose, S. Durocher, and W. Mulzer

Proceedings of the 11th International Conference and Workshops on Algorithms and Computation (WALCOM), Hsinchu, Taiwan, 2017, pp. 308–319.

Invited to the special issue on WALCOM 2017 (TCS).

Improved Time-Space Trade-offs for Computing Voronoi Diagrams

B. Banyassady, M. Korman, W. Mulzer, A. van Renssen, M. Roeloffzen, P. Seiferth, and Y. Stein

Proceedings of the 34th International Symposium on Theoretical Aspects of Computer Science (STACS), Hannover, Germany, 2017, pp. 9:1–9:14.

The Rainbow at the End of the Line – A PPAD Formulation of the Colorful Carathéodory Theorem with Applications

F. Meunier, W. Mulzer, P. Sarrabezolles, and Y. Stein

Proceedings of the 28th ACM-SIAM Symposium on Discrete Algorithms (SODA), Barcelona, Spain, 2017, pp. 1342–1351.

Dynamic Planar Voronoi Diagrams for General Distance Functions and their Algorithmic Applications

H. Kaplan, W. Mulzer, L. Roditty, P. Seiferth, and M. Sharir

Proceedings of the 28th ACM-SIAM Symposium on Discrete Algorithms (SODA), Barcelona, Spain, 2017, pp. 2495–2504.

Routing in Unit Disk Graphs

H. Kaplan, W. Mulzer, L. Roditty, and P. Seiferth

Proceedings of the 12th Latin American Theoretical Informatics Symposium (LATIN),

Ensenada, México, 2016, pp. 536–548.

Invited to the special issue on LATIN 2016 (Algorithmica).

An Optimal Algorithm for Reconstructing Point Set Order Types from Radial Orderings

O. Aichholzer, V. Kusters, W. Mulzer, A. Pilz, and M. Wettstein

Proceedings of the 26th International Symposium on Algorithms and Computation (ISAAC), Nagoya, Japan, 2015, pp. 505–516.

Invited to the special issue on ISAAC 2015 (IJCGA).

Time-Space Trade-offs for Triangulations and Voronoi Diagrams

M. Korman, W. Mulzer, A. van Renssen, M. Roeloffzen, P. Seiferth, and Y. Stein

Proceedings of the 14th Algorithms and Data Structures Symposium (WADS), Victoria, Canada, 2015, pp. 482–494.

Approximability of the Discrete Fréchet Distance

K. Bringmann and W. Mulzer

Proceedings of the 31st International Symposium on Computational Geometry (SoCG), Eindhoven, The Netherlands, 2015, pp. 739–753.

Invited to the special issue on SoCG 2015 (JoCG).

Spanners and Reachability Oracles for Directed Transmission Graphs

H. Kaplan, W. Mulzer, L. Roditty, and P. Seiferth

Proceedings of the 31st International Symposium on Computational Geometry (SoCG), Eindhoven, The Netherlands, 2015, pp. 156–170.

Computational Aspects of the Colorful Carathéodory Theorem

W. Mulzer and Y. Stein

Proceedings of the 31st International Symposium on Computational Geometry (SoCG), Eindhoven, The Netherlands, 2015, pp. 44–58.

Approximate k -flat Nearest Neighbor Search

W. Mulzer, H. L. Nguyễn, P. Seiferth, and Y. Stein

Proceedings of the 47th Annual Symposium on the Theory of Computing (STOC), Portland, USA, 2015, pp. 783–792.

Interference Minimization in Asymmetric Sensor Networks

Y. Brise, K. Buchin, D. Eversmann, M. Hoffmann, and W. Mulzer

Proceedings of the 10th International Symposium on Algorithms and Experiments for Sensor Systems, Wireless Networks and Distributed Robotics (ALGOSENSORS), Wrocław, Poland, 2014, pp. 135–151.

Four Soviets Walk the Dog—with an Application to Alt’s Conjecture

K. Buchin, M. Buchin, W. Meulemans, and W. Mulzer

Proceedings of the 25th ACM-SIAM Symposium on Discrete Algorithms (SODA), Portland, USA, 2014, pp. 1399–1413.

Algorithms for Tolerated Tverberg Partition

W. Mulzer and Y. Stein

Proceedings of the 24th International Symposium on Algorithms and Computation (ISAAC), Hong Kong, 2013, pp. 295–305.

Invited to the special issue on ISAAC 2013 (IJCGA).

Flip Distance Between Triangulations of a Simple Polygon is NP-Complete

O. Aichholzer, W. Mulzer, and A. Pilz

Proceedings of the 21st Annual European Symposium on Algorithms (ESA), Sophia Antipolis, France, 2013, pp. 13–24.

Computing the Fréchet Distance with a Retractable Leash

K. Buchin, M. Buchin, R. van Leusden, W. Meulemans, and W. Mulzer
Proceedings of the 21st Annual European Symposium on Algorithms (ESA), Sophia Antipolis, France, 2013, pp. 241–252.

Vertex Deletion for 3D Delaunay Triangulations

K. Buchin, O. Devillers, W. Mulzer, O. Schrijvers, and J. Shewchuk
Proceedings of the 21st Annual European Symposium on Algorithms (ESA), Sophia Antipolis, France, 2013, pp. 253–264.

Unions of Onions

M. Löffler and W. Mulzer
Proceedings of the 13th Algorithms and Data Structures Symposium (WADS), London, Canada, 2013, pp. 487–498.

Data Structures on Event Graphs

B. Chazelle and W. Mulzer
Proceedings of the 20th Annual European Symposium on Algorithms (ESA), Ljubljana, Slovenia, 2012, pp. 313–324.

Approximating Tverberg Points in Linear Time for Any Fixed Dimension

W. Mulzer and D. Werner
Proceedings of the 28th Annual Symposium on Computational Geometry (SoCG), Chapel Hill, USA, 2012, pp. 303–310.
Invited to the special issue on SoCG 2012 (IJCGA).

Self-Improving Algorithms for Coordinate-Wise Maxima

K. L. Clarkson, W. Mulzer, and C. Seshadhri
Proceedings of the 28th Annual Symposium on Computational Geometry (SoCG), Chapel Hill, USA, 2012, pp. 277–286.

Convex Hull of Imprecise Points in $o(n \log n)$ Time after Preprocessing

E. Ezra and W. Mulzer
Proceedings of the 27th Annual Symposium on Computational Geometry (SoCG), Paris, France, 2011, pp. 11–20.
Invited to the special issue on SoCG 2011 (CGTA).

Triangulating the Square and Squaring the Triangle: Quadrees and Delaunay Triangulations are Equivalent

M. Löffler and W. Mulzer
Proceedings of the 22nd ACM-SIAM Symposium on Discrete Algorithms (SODA), San Francisco, USA, 2011, pp. 1759–1777.

Self-Improving Algorithms for Convex Hulls

K. L. Clarkson, W. Mulzer, and C. Seshadhri
Proceedings of the 21st ACM-SIAM Symposium on Discrete Algorithms (SODA), Austin, USA, 2010, pp. 1546–1565.

Delaunay Triangulations in $O(\text{sort}(n))$ Time and More

K. Buchin and W. Mulzer
Proceedings of the 50th Annual Symposium on Foundations of Computer Science (FOCS), Atlanta, USA, 2009, pp. 139–148.

Delaunay Triangulation of Imprecise Points Simplified and Extended

K. Buchin, M. Löffler, P. Morin, and W. Mulzer
Proceedings of the 11th Algorithms and Data Structures Symposium (WADS), Banff, Canada, 2009, pp. 131–143.

Computing Hereditary Convex Structures

B. Chazelle and W. Mulzer

Proceedings of the 25th Annual Symposium on Computational Geometry (SoCG), Aarhus, Denmark, 2009, pp. 61–70.

Invited to the special issue on SoCG 2009 (DCG).

Markov Incremental Constructions

B. Chazelle and W. Mulzer

Proceedings of the 24th Annual Symposium on Computational Geometry (SoCG), College Park, USA, 2008, pp. 156–163.

Invited to the special issue on SoCG 2008 (DCG).

Minimum Weight Triangulation is NP-hard

W. Mulzer and G. Rote

Proceedings of the 22nd Annual Symposium on Computational Geometry (SoCG), Sedona, USA, 2006, pp. 1–10.

Invited to the special issue on SoCG 2006 (DCG).

WEAKLY
REFEREED
CONFERENCES
AND WORKSHOPS**Minimal Geometric Graph Representations of Order Types**

O. Aichholzer, M. Balko, M. Hoffmann, J. Kynčl, W. Mulzer, I. Parada, A. Pilz, M. Scheucher, P. Valtr, B. Vogtenhuber, and E. Welzl

Proceedings of the 34th European Workshop on Computational Geometry (EWCG), Berlin, Germany, 2018, pp. 21:1–6.

Stabbing Pairwise Intersecting Disks by Five Points

S. Har-Peled, H. Kaplan, W. Mulzer, L. Roditty, P. Seiferth, M. Sharir, and M. Willert

Proceedings of the 34th European Workshop on Computational Geometry (EWCG), Berlin, Germany, 2018, pp. 29:1–6.

NP-Completeness of Max-Cut for Segment Intersection Graphs

O. Aichholzer, W. Mulzer, P. Schneider, and B. Vogtenhuber

Proceedings of the 34th European Workshop on Computational Geometry (EWCG), Berlin, Germany, 2018, pp. 32:1–6.

Combinatorics of Beacon-based Routing in Three Dimensions

J. Cleve and W. Mulzer

Proceedings of the 34th European Workshop on Computational Geometry (EWCG), Berlin, Germany, 2018, pp. 48:1–6.

Time-Space Trade-Offs for Computing Euclidean Minimum Spanning Trees

L. Barba, B. Banyassady, and W. Mulzer

Proceedings of the 34th European Workshop on Computational Geometry (EWCG), Berlin, Germany, 2018, pp. 51:1–6.

Finding the Girth in Disk Graphs and a Directed Triangle in Transmission Graphs

H. Kaplan, K. Klost, W. Mulzer, and L. Roditty

Proceedings of the 34th European Workshop on Computational Geometry (EWCG), Berlin, Germany, 2018, pp. 68:1–6.

Routing in Simple Polygons

M. Korman, W. Mulzer, A. van Renssen, M. Roeloffzen, P. Seiferth, Y. Stein, B. Vogtenhuber, and M. Willert

Proceedings of the 33rd European Workshop on Computational Geometry (EWCG), Malmö, Sweden, 2017, pp. 17–20.

Invited to the special issue on EWCG 2017 (CGTA).

An Experimental Study of Algorithms for Geodesic Shortest Paths in the Constant Workspace Model

J. Cleve and W. Mulzer

Proceedings of the 33rd European Workshop on Computational Geometry (EWCG), Malmö, Sweden, 2017, pp. 165–168.

Finding Triangles and Computing the Girth in Disk Graphs

H. Kaplan, W. Mulzer, L. Roditty, and P. Seiferth

Proceedings of the 33rd European Workshop on Computational Geometry (EWCG), Malmö, Sweden, 2017, pp. 205–208.

Delta-Fast Tries: Local Searches in Bounded Universes with Linear Space

M. Ehrhardt and W. Mulzer

Proceedings of the 33rd European Workshop on Computational Geometry (EWCG), Malmö, Sweden, 2017, pp. 257–260.

Invited to the special issue on EWCG 2017 (CGTA).

A Simple Analysis of Rabin’s Algorithm for Finding Closest Pairs

B. Banyassady and W. Mulzer

Proceedings of the 33rd European Workshop on Computational Geometry (EWCG), Malmö, Sweden, 2017, pp. 261–264.

Dynamic Connectivity for Unit Disk Graphs

H. Kaplan, W. Mulzer, L. Roditty, and P. Seiferth

Proceedings of the 32nd European Workshop on Computational Geometry (EWCG), Lugano, Switzerland, 2016.

Generalized Colorful Linear Programming and Further Applications

F. Meunier, W. Mulzer, P. Sarrabezolles, and Y. Stein

Proceedings of the 32nd European Workshop on Computational Geometry (EWCG), Lugano, Switzerland, 2016.

Finding the k -Visibility Region of a Point in a Simple Polygon in the Memory-Constrained Model

Y. Bahoo, B. Banyassady, P. Bose, S. Durocher, and W. Mulzer

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Fine-Grained Analysis of Problems on Curves

K. Buchin, M. Buchin, M. Konzack, W. Mulzer, and A. Schulz

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Approximating the Colorful Carathéodory Theorem

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The Number of Combinatorially Different Convex Hulls of Points in Lines

H. Kim, W. Mulzer, and E. Oh

Proceedings of the 31st European Workshop on Computational Geometry (EWCG), Ljubljana, Slovenia, 2015, pp. 161–164.

Efficient Spanner Construction for Directed Transmission Graphs

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Time-Space Trade-offs for Voronoi Diagrams

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Ljubljana, Slovenia, 2015, pp. 248–251.
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Low-Crossing Spanning Trees: an Alternative Proof and Experiments

P. Giannopoulos, M. Konzack, and W. Mulzer
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Reachability Oracles for Disk Transmission Graphs

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Minimum Dual Diameter Triangulations

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Complexity of Finding Nearest Colorful Polytopes

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Unions of Onions

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Flip Distance Between Triangulations of a Simple Polygon is NP-Complete

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Memory-Constrained Algorithms for Simple Polygons

T. Asano, K. Buchin, M. Buchin, M. Korman, W. Mulzer, G. Rote, and A. Schulz
Proceedings of the 4th Workshop on MASSIVE Data Algorithmics (MASSIVE),
Ljubljana, Slovenia, 2012, pp. 30–44.

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T. Asano, K. Buchin, M. Buchin, M. Korman, W. Mulzer, G. Rote, and A. Schulz
Proceedings of the 28th European Workshop on Computational Geometry (EWCG),
Assisi, Italy, 2012, pp. 49–52.

A Lower Bound for Shallow Partitions

W. Mulzer and D. Werner
Proceedings of the 28th European Workshop on Computational Geometry (EWCG),
Assisi, Italy, 2012, pp. 129–132.

Approximating Tverberg Points in Linear Time for Any Fixed Dimension

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Convex Hull of Imprecise Points in $o(n \log n)$ Time after Preprocessing

E. Ezra and W. Mulzer

Proceedings of the 27th European Workshop on Computational Geometry (EWCG), Morschach, Switzerland, 2011, pp. 209–212.

Invited to the special issue on EWCG 2011 (CGTA).

Linear-Time Delaunay Triangulations Simplified

K. Buchin and W. Mulzer

Proceedings of the 25th European Workshop on Computational Geometry (EWCG), Brussels, Belgium, 2009, pp. 235–238.

An Exclusion Region for the Minimum Dilation Triangulation

C. Knauer and W. Mulzer

Proceedings of the 21st European Workshop on Computational Geometry (EWCG), Eindhoven, The Netherlands, 2005, pp. 33–36.

TECHNICAL
REPORTS AND
THESES

Reachability Oracles for Directed Transmission Graphs

H. Kaplan, W. Mulzer, L. Roditty, and P. Seiferth

arXiv:1601.07797.

Spanners for Directed Transmission Graphs

H. Kaplan, W. Mulzer, L. Roditty, and P. Seiferth

arXiv:1601.07798.

LiveCG: an Interactive Visualization Environment for Computational Geometry

S. Kürten and W. Mulzer

Multimedia Proceedings of the 30 Annual ACM Symposium on Computational Geometry (SoCG), Kyoto, Japan, 2014, pp. 86–87.

Low-Entropy Computational Geometry

W. Mulzer

Doctoral Thesis. Princeton University, 2010.

A Constant-Work-Space Algorithm for Shortest Paths in Simple Polygons

T. Asano, W. Mulzer, and Y. Wang

Accompanying an invited talk in Proceedings of the 4th Workshop on Algorithms and Computation (WALCOM), Dhaka, Bangladesh, 2010, pp. 9–20.

Minimum Dilation Triangulations

C. Knauer and W. Mulzer

Technical Report B-05-06. Freie Universität Berlin, April 2005.

Minimum Dilation Triangulations for the Regular n -Gon

W. Mulzer

Masters Thesis. Freie Universität Berlin, 2004.

GRANTS

DFG Grant MU 3501/1-1 — “Strukturierte Eingaben für geometrische Probleme charakterisieren, verstehen und ausnutzen”

3 years, 248.000 €

GIF Grant 1161/2011 — “Dynamic and kinetic algorithms in theory and in practice”
Principal Investigator with Haim Kaplan, Liam Roditty, Cooperating Investigators
Kurt Mehlhorn and Umut Acar
3 years, 180.000 €

DFG Grant MU 3501/2-1 — “Geometrische Algorithmen mit beschränktem Arbeitsspeicher”
Principal Investigator with Günter Rote.
3 years, 221.600 €

DFG Grant MU 3501/1-2 — “Strukturierte Eingaben für geometrische Probleme charakterisieren, verstehen und ausnutzen”
2 years, 160.000 €

GIF Grant 1367/2016 — “Algorithms for Geometric Graphs – Tools, Techniques, Applications”
Principal Investigator with Haim Kaplan, Liam Roditty, and Micha Sharir
3 years, 160.000 €

ERC StG 757609—“Complexity Inside NP—A Computational Geometry Perspective”
5 years, 1,486,800 €

DFG Grant MU 3501/4-1 — “34. Europäischer Workshop über Algorithmische Geometrie”
15.000 €

DFG Grant MU 3501/3-1 — “Arrangements and Graph Drawing”
Principal Investigator with Stefan Felsner, Michael Hoffmann, and Birgit Vogtenhuber
2 years, 175.800 €

DFG Grant MU 3501/2-2 — “Geometrische Algorithmen mit beschränktem Arbeitsspeicher”
1 year, 82.400 €

INVITED TALKS

Computational Geometry with Limited Work-Space: State of the Art and Challenges
Fields Workshop on Discrete and Computational Geometry
July 2017

Routing in Unit Disk Graphs
LIGM — Université Paris-Est Marne-la-Vallée
May 2016

Approximate k -flat Nearest Neighbor Search
Tohoku University — Reading Group
March 2016

New Perspectives on Old Problems
FSU Jena — Department Colloquium
November 2015

Approximability of the Discrete Fréchet Distance
Carleton University — Algorithms Seminar
August 2015

Was ist ein Beweis? Ansichten eines Informatikers
FU Berlin — Verleihung der Dr. Hans Riegel-Fachpreise 2015
May 2015

Computational Geometry with Bounded Workspace
Amirkabir University — 7th Winter School on Computational Geometry
February 2015

New Algorithms for the Fréchet Distance
Shiraz University — Shiraz University Robotics Association
February 2015

New Algorithms for Classic Problems from Computational Geometry
TU Graz — Colloquium on Computational Topology and Geometry
January 2015

Complexity of Finding Nearest Colorful Polytopes
Tohoku University — Network Algorithms Seminar
November 2014

Approximating the Colorful Carathéodory Theorem
Tel Aviv University — Computational Geometry Seminar
October 2014

New Algorithms for Classic Problems from Computational Geometry
Universität Hamburg – Department Colloquium
June 2014

New Algorithms for the Fréchet Distance
Universität Bonn – Department Colloquium
February 2014

New Algorithms for the Fréchet Distance
Max Planck Institut für Informatik – D1 Seminar
December 2013

Planar Delaunay Triangulations and Proximity Structures
ERC “SDModels” Workshop: Delaunay Geometry: Polytopes, Triangulations and
Spheres
October 2013

Unions of Onions
Ben Gurion University — Theory Reading Group
May 2013

Computing the Fréchet Distance with a Retractable Leash
Tel Aviv University — Computational Geometry Seminar
May 2013

Four Soviets Walk the Dog
Universität Bayreuth — Department Colloquium
May 2013

Self-improving Algorithms for Coordinate-wise Maxima
TU Eindhoven — Noon Seminar
August 2012

A Lower Bound for Shallow Partitions
 Technische Universität Berlin — MDS Colloquium
 February 2012

Triangulating the Square and Squaring the Triangle
 TU Eindhoven — Noon Seminar
 May 2011

Triangulating the Square and Squaring the Triangle
 Université libre de Bruxelles — Computer Science Seminar
 May 2011

Triangulating the Square and Squaring the Triangle
 Humboldt Universität zu Berlin — MDS Colloquium
 January 2011

Low-Entropy Computational Geometry
 University of Texas at San Antonio — CS Department Colloquium
 March 2010

Delaunay Triangulations in $O(\text{sort}(n))$ Time and More
 Carleton University — Algorithms Seminar
 February 2010

Low-Entropy Computational Geometry
 Freie Universität Berlin — CS Department Colloquium
 January 2010

Delaunay Triangulations in $O(\text{sort}(n))$ Time and More
 IBM T. J. Watson Research Center — IP Seminar
 November 2009

Markov Incremental Constructions
 Princeton University — CS Industrial Affiliates Day
 September 2008

TEACHING

Grundlagen der Theoretischen Informatik
 (Theory of Computation) **Spring 2018**

Nichtsequentielle und Verteilte Programmierung
 (Concurrent and Distributed Programming, with Katinka Wolter)

Algorithmen, Datenstrukturen und Datenabstraktion
 (Algorithms, Data Structures and Data Abstraction) **Fall 2017/18**

Seminar über Algorithmen
 (Seminar on Algorithms)

Höhere Algorithmik II
 (Advanced Algorithms II) **Spring 2017**

Semantik von Programmiersprachen
 (Semantics of Programming Languages)

Proseminar Theoretische Informatik
 (Undergraduate Seminar on Algorithms)

| | |
|---|---------------------|
| <i>Höhere Algorithmik</i> (Advanced Algorithms) | Fall 2016/17 |
| <i>Randomisierte Algorithmen</i> (Randomized Algorithms, with Paul Seiferth) | |
| <i>Informatik B</i> (Computer Science B) | Spring 2016 |
| <i>Komplexitätstheorie</i> (Computational Complexity Theory, with Claudia Dieckmann) | |
| <i>Informatik A</i> (Computer Science A) | Fall 2015/6 |
| <i>Proseminar Theoretische Informatik</i> (Undergraduate Seminar on the Theory of Computation) | |
| <i>Grundlagen der Theoretischen Informatik</i> (Theory of Computation) | Spring 2015 |
| <i>Höhere Algorithmik 2</i> (Advanced Algorithms 2, with Lena Schlipf and Yannik Stein) | |
| <i>Grundlagen der Theoretischen Informatik</i> (Theory of Computation) | Spring 2014 |
| <i>Datenstrukturen</i> (Data Structures, with Claudia Dieckmann and Yannik Stein) | |
| <i>Algorithmen und Programmierung III</i> (Algorithms and Programming III) | Fall 2013/4 |
| <i>Seminar über Algorithmen</i> (Seminar on Algorithms, with Yannik Stein) | |
| <i>Algorithmische Geometrie</i> (Computational Geometry, with Panos Giannopoulos) | Spring 2013 |
| <i>Höhere Algorithmik 2</i> (Advanced Algorithms 2, with Helmut Alt) | |
| <i>Komplexitätstheorie</i> (Computational Complexity Theory) | Fall 2012/3 |
| <i>Grundlagen der Theoretischen Informatik</i> (Theory of Computation) | Spring 2012 |
| <i>Approximation Algorithms</i> (with Panos Giannopoulos) | |
| <i>Höhere Algorithmik</i> (Advanced Algorithms) | Fall 2011/2 |
| <i>Seminar über Algorithmen</i> (Seminar on Algorithms) | |

Algorithmische Geometrie
(Computational Geometry)

Spring 2011

Algorithmen und Programmierung III
(Algorithms and Programming III)

Fall 2010/1

In February 2013, I completed the *Berlin Certificate for University Teaching* (Berliner Zertifikat für Hochschullehre).

ADVISING

current postdocs: Aruni Choudhary

current PhD students: Bahareh Banyassady, Jonas Cleve, Katharina Klost, Max Willert

finished PhD:

1. *Disk Intersection Graphs: Models, Data Structures, and Algorithms*
Paul Seiferth (defended on 19.08.2016)
2. *The Colorful Carathéodory Problem and its Descendants*
Yannik Stein (defended on 21.10.2016)

finished undergraduate:

1. *Experimenteller Vergleich verschiedener binärer Suchbäume unter verschiedenen Abfragesequenzen*
Benjamin Bortfeld (Dipl-Inform., finished on 19.07.2012)
2. *Computational Aspects of Triangulations with Constant Dilation*
Paul Seiferth (MSc Inf, finished on 26.11.2012)
3. *APSP-Schätzer in Hamiltonschen Graphen*
Robert Engelhoven (Dipl-Math., finished on 20.12.2012)
4. *Theoretische und Experimentelle Untersuchung von Kuckucks-Hashing*
Terese Haimberger (BSc Inf, finished on 29.01.2013)
5. *Theoretische Betrachtung von B^+ -Bäumen mit vereinfachter Löschoption*
Nadja Scharf (BSc Inf, finished on 08.03.2013)
6. *Tolerated Tverberg Partitions: An Algorithmic Approach*
Yannik Stein (MSc Inf, finished on 28.03.2013)
7. *Interferenzminimierung in eindimensionalen Sensornetzen*
Dustin Eversmann (Dipl-Inform., finished on 05.04.2013)
8. *Quake-Heap vs Fibonacci-Heap: Implementierung, Untersuchung, Bewertung*
Daniel Krompass (BSc Inf, finished on 20.06.2013)
9. *Approximative Computations on Spanning Trees with Low Crossing Number*
Maximilian Konzack (MSc Inf, finished on 30.07.2013)
10. *Planarity Testing via PQ-Trees: Then and Now*
Christopher Pockrandt (BSc Inf, finished on 19.09.2013)
11. *Approximation Algorithms for Interval Scheduling Problems with Given Machines*
Robert L. Gottwald (BSc Inf, finished on 21.02.2014)
12. *LiveCG: a Framework for Interactive Visualization of Algorithms from Computational Geometry*
Sebastian Kürten (MSc Inf, finished on 24.04.2014)

13. *Details on the Integer Sorting Algorithm by Han and Thorup Using $O(n\sqrt{\log \log n})$ Time and Linear Space*
Katharina Klost (BSc Inf, finished on 15.01.2015)
14. *Untersuchung einer Verbesserung des Algorithmus für das 3SUM-Problem und Anwendung an einem 3SUM-schweren Problem*
Lilian Hung (BSc Inf, finished on 05.02.2015)
15. *Implementation of and Experiments on Centerpoint Approximation Algorithms*
Alexander Kauer (BSc Inf, finished on 17.02.2015)
16. *Implementierung eines Approximations-Algorithmus für die Berechnung der diskreten Fréchet-Metrik*
Tudor Soroceanu (BSc Inf, finished on 19.05.2015)
17. *Entwicklung und Implementierung eines Verfahrens zur automatisierten CAD-Baugruppenrekonstruktion*
Josephine Mertens (BSc Inf, finished on 20.05.2015)
18. *"Unions of onions: Preprocessing imprecise points for fast onion decomposition" — Die Implementierung und Visualisierung des Algorithmus*
Manuel Jain (Dipl-Inform., finished on 27.08.2015)
19. *Darstellung und Vergleich von Beweisen für planare Separatoren*
Nico Hinze (BSc Inf, finished on 28.08.2015)
20. *An In-Depth Analysis of Data Structures Derived from van-Emde-Boas-Trees*
Marcel Ehrhardt (MSc Inf, finished on 22.10.2015)
21. *Dissecting DOS 1.x. Details Beyond the Known Historical Parts*
Johannes Tigges (BSc Inf, finished on 02.02.2016)
22. *Implementierung einer Datenstruktur für den dynamischen Zusammenhang für allgemeine und Unit Disk Graphen*
Markus Sähn (BSc Inf, finished on 05.04.2016)
23. *Integration von Softwareprototypen zur optischen und teilautomatisierten Erkennung von Leiterplattenstrukturen*
Alexander Hinze-Hüttl (BSc Inf, finished on 25.05.2016)
24. *Routing Schemes for Disk Graphs and Polygons*
Max Willert (MEd, finished on 09.08.2016)
25. *Complexity of Regular Expression Matching*
Boris Dimitrov (BSc Inf, finished on 13.10.2016)
26. *Implementing an Algorithm for Routing in Unit-Disk-Graphs*
Christoph Brockmann (BSc Inf, finished on 18.10.2016)
27. *The complexity class Polynomial Local Search (PLS) and PLS-complete problems*
Michaela Borzechowski (BSc Inf, finished on 25.10.2016)
28. *On Planar 3-SAT and its Variants*
Simon Tippenhauer (MSc Inf, finished on 15.11.2016)
29. *Deterministisches Partitionieren in linearer Zeit auf der Word-RAM*
Benjamin Aram Berendsohn (BSc Inf, finished on 06.12.2016)
30. *Erstellung eines GLL-Parsergenerators für kontextfreie Grammatiken*
Miro Baeten (BSc Inf, finished on 14.02.2017)
31. *Complexity of recognizing generalized transmission graphs*
Katharina Klost (MSc Inf, finished on 16.03.2017)

32. *Combinatorics of Beacon-based Routing and Guarding in Three Dimensions*
Jonas Cleve (MSc Inf, finished on 30.03.2017)
33. *Kompression von Englischen Texten unter Verwendung von Lexikalischer Kategorisierung und PPM*
Michael Wesolek (BSc Inf, finished on 18.04.2017)
34. *Aufbau und Struktur von CP/M 1.3 im historischen Kontext*
Tilman Blumenbach (BSc Inf, finished on 05.05.2017)
35. *Jump Point Search auf verallgemeinerten Spielbrettern*
Felix Wiener (BSc Inf, finished on 04.07.2017)
36. *Implementierung eines Flower Pollination Algorithmus, zur Minimierung des Fréchet-Abstands*
Henning Steinmetz (BSc Inf, finished on 11.07.2017)
37. *Optimale Orientierung eines 3D-Modells für den Metalldruck*
Jakob Köhler (BSc Inf, finished on 08.08.2017)
38. *Image Sensitivity Analysis with Deep Neural Networks*
Zacharias Fisches (BSc Inf, finished on 25.09.2017)
39. *Radial Systems in Three Dimensions*
Alexander Kauer (MSc Inf, finished on 29.09.2017)
40. *Fast dynamic planar convex set maintenance using finger trees*
Christian Hofer (BSc Inf, finished on 05.12.2017)

in progress undergraduate: Simon Putzke (MSc Inf), David Sungaila (MSc Inf), Florian Hartmann (MSc Inf), Felicitas Landes (BSc Inf)

reader: Christian Richter (Dipl-Math., 2012), Robert Georges (Dipl-Math., 2012), Thore Kübart (Dipl-Math., 2012), Simon Tippenhauer (BSc Inf, 2012), István Bartkowiak (BSc Inf, 2013), Christian Windolf (BSc Inf, 2013), Felix Herter (BSc Inf, 2014), Max Willert (BSc Inf, 2014), Dirk Braun (BSc Inf, 2015), Nadja Scharf (MSc Inf, 2015), Dirk Braun (MEd, 2015), Christoph Krüger (MSc Inf, 2016), Nils Bussas (MSc Inf, 2017), Tobias Groß (BSc Inf, 2017)

PhD committee member: Jens M. Schmidt (Dr. rer. nat., 2011), Sven Scholz (Dr. rer. nat., 2011), Claudia Dieckmann (Dr. rer. nat., 2012), Daniel Werner (Dr. rer. nat., 2013), Rafel Jaume Deyà (Dr. rer. nat., 2014), Pauline Sarrabezolles (Docteur, 2015), Sebastian Müller (Dr. rer. nat., 2015), Heuna Kim (Dr. rer. nat., 2016), Christopher Kusch (Dr. rer. nat., 2017)

PhD thesis reviewer: Udo Hoffmann (Dr. rer. nat., 2016), Kai Jin (PhD, 2016), Stef Sijben (Dr. rer. nat., 2017), Quirijn Bouts (Dr., 2017)

SERVICE

- Editorial Boards: JoCG, TALG
- PC Chair: SoCG 2015 (video), EuroCG 2018 (co-chair with Matias Korman)
- PC Memberships: EuroCG 2014, SoCG 2014 (video), ISAAC 2014, ICALP 2015 (Track A), ICALP 2015 Young Researcher Forum, SKILL 2015, EuroCG 2016, SoCG 2016, SKILL 2016, EuroCG 2017, ESA 2017 (Track A), CCCG 2017, SODA 2018, EGC 2019
- Reviewer for JACM (3x), IJCGA (4x), CGTA (7x), SICOMP (5x), DCG (4x), JoCG (5x), IPL (3x), JDA, DMTCS, TCS (3x), Algorithmica (4x), InfComp, IJFCS, JCSS, TOCS, TALG, Israel Science Foundation (ISF, 3x), US-Israel Binational Science Foundation (BSF), DAAD, Danish Council for Independent Research (DFF), Austrian Science Fund (FWF), ACM India Dissertation Award,

RGC Hong Kong (2x), SoCG 2005 (3x), LATIN 2008, SODA 2010, STACS 2010, ESA 2010, FSTTCS 2010, SODA 2011, WADS 2011, ICALP 2011 (3x), ESA 2011, SoCG 2012, FOCS 2012, ESA 2012 (2x), MFCS 2012, SODA 2013 (2x), STACS 2013 (2x), CIAC 2013, SoCG 2013, WADS 2013, APPROX 2013, ESA 2013 (2x), SODA 2014, SoCG 2014 (2x), SEA 2014, ESA 2014 (4x), SODA 2015 (2x), STACS 2015 (2x), SoCG 2015 (3x), FOCS 2015, ESA 2015 (3x), SODA 2016 (3x), STOC 2016 (2x), SWAT 2016 (2x), ICALP 2016 (2x), COCOON 2016, FOCS 2016, ESA 2016 (2x), MFCS 2016 (2x), GD 2016, ISAAC 2016 (2x), SODA 2017, STOC 2017, CIAC 2017, SoCG 2017 (7x), CCC 2017, WADS 2017, FOCS 2017 (2x), FCT 2017, ISAAC 2017, WALCOM 2018, LATIN 2018 (2x), Ernst-Reuter-Preis 2017, SoCG 2018 (2x), ICALP 2018 (4x), SWAT 2018 (2x), SEA 2018

- Organization of Scientific Meetings: HA 65, BC 60, FUB-TAU Joint Research Workshop on Algorithms in Geometric Graphs, EuroCG 2018
- Chair of the Computer Science Department (geschäftsführender Direktor), Fall 2013/14–now.
- Member of the council for the Institute of Computer Science (Institutssrat), FU Berlin, Fall 2013/14–now.
- Member of the council for the Department of Mathematics and Computer Science (Fachbereichsrat), FU Berlin, Spring 2011–Fall 2012/13, Spring 2017–now.
- Substitute Member of the Extended Academic Council of FU Berlin, Fall 2013/14–Spring 2015.
- Representative of the Institute of Computer Science at the FU Berlin visit day for high-school students (inFU-Tage) 2011–2015.
- Interviewer for the selection of MSc students in Computer Science at FU Berlin in Fall 2012/13 and Fall 2013/14 (with Lutz Prechelt).
- Selection committee for the Dr. Hans Riegel-Fachpreise for computer science at FU Berlin 2016 and 2017.

PROFESSIONAL MEMBERSHIPS ACM, ACM SIGACT, DMV, EATCS, GI

TECHNICAL SKILLS Programming: C, C++, Pascal, Java, PHP, Haskell, UNIX shell scripting, SQL, x86 Assembler, Python

Languages: German (native), English (Fluent), French (Intermediate), Spanish (Basic)