

# Wolfgang Johann Heinrich Mulzer

---

CONTACT INFORMATION Institut für Informatik Freie Universität Berlin Takustraße 9 14195 Berlin, Germany  
Voice: +49 30 838 75165  
Fax: +49 30 838 475165  
WWW: <http://page.mi.fu-berlin.de/mulzer>  
E-Mail: [mulzer@inf.fu-berlin.de](mailto:mulzer@inf.fu-berlin.de)

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 Participated in the first Heidelberg Laureate Forum, September 2013

Wallace Memorial Fellowship in Engineering

- Princeton University Honoric 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

### **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, to appear.

### **Encoding Arguments**

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

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

## JOURNAL PUBLICATIONS

### **Routing in Unit Disk Graphs**

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

Algorithmica, to appear.

Special issue on LATIN 2016.

### **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.

### **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 Decomposition**

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 Preprocessing**

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

**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, to appear.

**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, to appear.

**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 PPA 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), Wrozwław, 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: Quadtrees 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**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

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

**Fine-Grained Analysis of Problems on Curves**

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

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

**Approximating the Colorful Carathéodory Theorem**

W. Mulzer and Y. Stein

Proceedings of the 31st European Workshop on Computational Geometry (EWCG), Ljubljana, Slovenia, 2015, pp. 20–23.

Invited to the special issue on EWCG 2015 (CGTA).

**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**

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

Proceedings of the 31st European Workshop on Computational Geometry (EWCG), Ljubljana, Slovenia, 2015, pp. 172–175.

Invited to the special issue on EWCG 2015 (CGTA).

**Time-Space Trade-offs for Voronoi Diagrams**

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

Proceedings of the 31st European Workshop on Computational Geometry (EWCG),



Ljubljana, Slovenia, 2015, pp. 248–251.  
Invited to the special issue on EWCG 2015 (CGTA).

**Low-Crossing Spanning Trees: an Alternative Proof and Experiments**

P. Giannopoulos, M. Konzack, and W. Mulzer  
Proceedings of the 30th European Workshop on Computational Geometry (EWCG),  
Ein-Gedi, Israel, 2014.

**Reachability Oracles for Disk Transmission Graphs**

H. Kaplan, W. Mulzer, L. Roditty, and P. Seiferth  
Proceedings of the 30th European Workshop on Computational Geometry (EWCG),  
Ein-Gedi, Israel, 2014.

**Minimum Dual Diameter Triangulations**

M. Korman, S. Langerman, W. Mulzer, A. Pilz, and B. Vogtenhuber  
Proceedings of the 30th European Workshop on Computational Geometry (EWCG),  
Ein-Gedi, Israel, 2014.

**Complexity of Finding Nearest Colorful Polytopes**

W. Mulzer and Y. Stein  
Proceedings of the 30th European Workshop on Computational Geometry (EWCG),  
Ein-Gedi, Israel, 2014.

**Unions of Onions**

M. Löffler and W. Mulzer  
Proceedings of the 29th European Workshop on Computational Geometry (EWCG),  
Brunswick, Germany, 2013, pp. 61–64.

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

O. Aichholzer, W. Mulzer, and A. Pilz  
Proceedings of the 29th European Workshop on Computational Geometry (EWCG),  
Brunswick, Germany, 2013, pp. 115–118.

**Computational Aspects of Triangulations with Bounded Dilation**

W. Mulzer and P. Seiferth  
Proceedings of the 29th European Workshop on Computational Geometry (EWCG),  
Brunswick, Germany, 2013, pp. 123–126.

**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.

**Memory-Constrained Algorithms for Simple Polygons**

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**

W. Mulzer and D. Werner  
Proceedings of the 28th European Workshop on Computational Geometry (EWCG),  
Assisi, Italy, 2012, pp. 165–168.

**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”  
20.000 €

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	<i>Algorithmen, Datenstrukturen und Datenabstraktion</i> (Algorithms, Data Structures and Data Abstraction)	<b>Fall 2017/18</b>
	<i>Seminar über Algorithmen</i> (Seminar on Algorithms)	
	<i>Höhere Algorithmik II</i> (Advanced Algorithms II)	<b>Spring 2017</b>
	<i>Semantik von Programmiersprachen</i> (Semantics of Programming Languages)	
	<i>Proseminar Theoretische Informatik</i> (Undergraduate Seminar on Algorithms)	
	<i>Höhere Algorithmik</i> (Advanced Algorithms)	<b>Fall 2016/17</b>
	<i>Randomisierte Algorithmen</i> (Randomized Algorithms, with Paul Seiferth)	
	<i>Informatik B</i> (Computer Science B)	<b>Spring 2016</b>
	<i>Komplexitätstheorie</i> (Computational Complexity Theory, with Claudia Dieckmann)	
	<i>Informatik A</i> (Computer Science A)	<b>Fall 2015/6</b>
<i>Proseminar Theoretische Informatik</i> (Undergraduate Seminar on the Theory of Computation)		
<i>Grundlagen der Theoretischen Informatik</i> (Theory of Computation)	<b>Spring 2015</b>	

<i>Höhere Algorithmik 2</i> (Advanced Algorithms 2, with Lena Schlipf and Yannik Stein)	
<i>Grundlagen der Theoretischen Informatik</i> (Theory of Computation)	<b>Spring 2014</b>
<i>Datenstrukturen</i> (Data Structures, with Claudia Dieckmann and Yannik Stein)	
<i>Algorithmen und Programmierung III</i> (Algorithms and Programming III)	<b>Fall 2013/4</b>
<i>Seminar über Algorithmen</i> (Seminar on Algorithms, with Yannik Stein)	
<i>Algorithmische Geometrie</i> (Computational Geometry, with Panos Giannopoulos)	<b>Spring 2013</b>
<i>Höhere Algorithmik 2</i> (Advanced Algorithms 2, with Helmut Alt)	
<i>Komplexitätstheorie</i> (Computational Complexity Theory)	<b>Fall 2012/3</b>
<i>Grundlagen der Theoretischen Informatik</i> (Theory of Computation)	<b>Spring 2012</b>
<i>Approximation Algorithms</i> (with Panos Giannopoulos)	
<i>Höhere Algorithmik</i> (Advanced Algorithms)	<b>Fall 2011/2</b>
<i>Seminar über Algorithmen</i> (Seminar on Algorithms)	
<i>Algorithmische Geometrie</i> (Computational Geometry)	<b>Spring 2011</b>
<i>Algorithmen und Programmierung III</i> (Algorithms and Programming III)	<b>Fall 2010/1</b>

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

#### ADVISING

**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 Löschooperation*  
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)

**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
- Reviewer for JACM (3x), IJCGA (3x), CGTA (6x), SICOMP (5x), DCG (4x), JoCG (5x), IPL (3x), JDA, DMTCS, TCS (2x), Algorithmica (4x), InfComp, IJFCS, JCSS, TOCS, Israel Science Foundation (ISF, 3x), US-Israel Binational Science Foundation (BSF), DAAD, Danish Council for Independent Research (DFR), 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
- Organization of Scientific Meetings: HA 65, BC 60, 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)