

Anne Driemel

Prof. Dr. Anne Driemel
Institut für Informatik V
Universität Bonn
Friedrich-Hirzebruch-Allee 5
53115 Bonn, Germany
☎ +49 1511 0381037
✉ driemel@cs.uni-bonn.de
🏠 anne.driemel.net

Current Position

W2-Professor (tenured) of Theoretical Computer Science at the University of Bonn
Bonn Junior Fellow of the Hausdorff Center for Mathematics

Education

- 2013 **PhD in Computing Science**, *Utrecht University*, The Netherlands.
Thesis: “Realistic Analysis for Algorithmic Problems on Geographical Data”
Advisors: Prof. Marc van Kreveld, Utrecht University
Prof. Mark de Berg, TU Eindhoven
- 2009 **Diplom in Computer Science**, *Free University*, Berlin, Germany.
Thesis: “Multiscale Curvature Matching for Smooth Polylines”
Advisor: Prof. Helmut Alt, Free University of Berlin
- 2002 **Abitur (Secondary School)**, Fürstenwalde, Germany.

Employment

(I worked part-time where indicated because of parental leave for two children)

- since **Associate Professor (W2, tenured)**, *University of Bonn*, Germany.
- Dec 2018 Head of group on Computational Geometry within Section on Algorithms and Complexity
- Jan 2015 – **Assistant Professor (0.8 fte)**, *TU Eindhoven*, the Netherlands.
- Dec 2018 *Group*: Data Mining, Prof. Mykola Pechenizkiy
- Apr 2014 – **Postdoc (0.8 fte)**, *TU Eindhoven*, the Netherlands.
- Jan 2015 *Group*: Information Systems/ Web Engineering, Prof. Paul de Bra
- Oct 2013 – **Wissenschaftlicher Mitarbeiter (0.75 fte)**, *TU Dortmund*, Dortmund, Germany.
- Mar 2014 *Group*: Algorithms and Complexity, Prof. Christian Sohler
- Sep 2009 – **Assistent in opleiding (AIO)**, *Utrecht University*, Utrecht, the Netherlands.
- Sep 2013 *Group*: Multimedia and Geometry, Prof. Remco Veltkamp
- Sep 2008 – **Studentische Hilfskraft**, *Free University*, Berlin, Germany.
- Mar 2009 Dept. of Computer Science
- Sep 2004 – **Studentische Hilfskraft**, *Free University*, Berlin, Germany.
- Aug 2007 Dept. of Computer Science and Dept. of Comparative Literature

Awards and Grants

- 2021 **DFG-Project**, *Forecasting Trajectories*, 311.300 EUR.
Within the Research Unit *FOR 2535–Anticipating Human Behavior*.
Funded by the German Research Foundation (DFG).
- 2018 **Bonn Junior Fellow**.
Five-year appointment at the Hausdorff Center for Mathematics in Bonn.
Funded by the Excellence Initiative of the DFG (German Research Foundation).
- 2016 **KNAW Visiting Professor Program**, 10,000 EUR.
Financing travel and subsistence of my visitor Rob Hyndman from Monash University.
Funded by the Royal Netherlands Academy of Arts and Sciences (KNAW).
- 2014 **Innovational Research Incentives Scheme Veni**, 240,000 EUR.
Project title: “Clustering time series and trajectories”
Funded by the Netherlands Organization for Scientific Research (NWO).
- 2010 **MOVE Travel Grant**, 600 EUR.
To attend the *Summer School on Mobility, Data Mining, and Privacy*
- 2010 **Google Travel Grant for Female Students**, 500 USD.
To attend the *18th ACM SIGSPATIAL Int. Conf. on Adv. in Geographic Information Systems*
- 2007 **FU Berlin Direct Exchange Scholarship**, 18,300 USD.
To spend nine months at the *University of Pennsylvania (UPenn)*

Workshops and Schools (Selection)

- May 2021 **Computational Geometry (Seminar 21181)**.
(online) *Schloss Dagstuhl - Leibniz Center for Informatics*, Wadern, Germany
Organized together with:
- Siu-Wing Cheng, HKUST – Kowloon, HK
- Jeff M. Phillips, University of Utah, US
- June 2020 **Hausdorff School on Algorithmic Data Analysis**.
(postponed) *Hausdorff Center for Mathematics*, Bonn, Germany
Organized together with:
- Melanie Schmidt, University of Cologne, DE
- Apr 2019 **Computational Geometry (Seminar 17171)**.
Schloss Dagstuhl - Leibniz Center for Informatics, Wadern, Germany
Organized together with:
- Siu-Wing Cheng, HKUST – Kowloon, HK
- Jeff Erickson, University of Illinois, US
- Feb 2018 **Analysing large collections of time series**.
NII Shonan Meeting, Shonan Village Center, JPN
Organized together with:
- Rob Hyndman, Monash University, AU
- Galit Shmueli, NTHU, Taiwan
- Apr 2017 **Computational Geometry (Seminar 19181)**.
Schloss Dagstuhl - Leibniz Center for Informatics, Wadern, Germany
Organized together with:
- Otfried Cheong, KAIST - Daejeon
- Jeff Erickson, University of Illinois, US

Program Committees (Selection)

- 2022 **SOSA**, *SIAM Symposium on Simplicity in Algorithms*.
- 2022 **YRF (chair)**, *Computational Geometry: Young Researchers Forum*.
- 2021 **SOCG**, *International Symposium on Computational Geometry*.
- 2021 **ACDA**, *SIAM Conference on Applied and Computational Discrete Algorithms*.
- 2021 **ALLENEX**, *SIAM Symposium on Algorithm Engineering and Experiments*.
- 2020 **YRF**, *Computational Geometry: Young Researchers Forum*.
- 2020 **SODA**, *SIAM Symposium on Algorithms and Data Structures*.
- 2019 **EuroCG**, *European Workshop on Computational Geometry*.
- 2017 **ESA**, *25th European Symposium on Algorithms*.
- 2017 **SODA**, *SIAM Symposium on Algorithms and Data Structures*.

Editorial Responsibilities

- 2020 **ACM Transactions on Algorithms (TALG) - Special Issue on SODA'20**.

Service to the Scientific Community

- SafeToC Advocate**, *SIAM Symposium on Algorithms and Data Structures*.
- SafeToC Lead Advocate**, *International Symposium on Computational Geometry*.
- IGAFIT Member**, *Interest Group on Algorithmic Foundations of Information Technology*.

Invited Talks

- June 2021 **Data structures for proximity searching under the Fréchet distance**.
Workshop on Geometry and Mobility (part of CG Week 2021)
(online)
- Sep 2019 **Clustering Curves under the Fréchet distance**.
Anticipating Human Behavior Workshop
Bonn, DE
- Jul 2017 **Algorithms for Structures in Spaces of Curves**.
Workshop on Geometry and Machine Learning (part of CG Week 2017)
Brisbane, AUS
- May 2016 **Two decades of algorithms for the Fréchet distance**.
NII Shonan Meeting: Theory and Applications of Geometric Optimization
Shonan Village Center, JPN

Teaching

- 2021 **Grundlagen der Algorithmischen Geometrie (9 ECTS)**, *University of Bonn*.
Bachelor Informatik
Co-taught with: Herman Haverkort
- 2020/21 **Discrete and Computational Geometry (9 ECTS)**, *University of Bonn*.
Master Computer Science

- 2020 **Grundlagen des Maschinellen Lernens (9 ECTS)**, *University of Bonn*.
 Bachelor Informatik
 Co-taught with: Thomas Kesselheim
 ★ **Course was newly developed**
- 2019/20 **Discrete and Computational Geometry (9 ECTS)**, *University of Bonn*.
 Master Computer Science
 Co-taught with: Herman Haverkort
 ★ **Course was newly developed**
- 2018/19 **Grundlagen der Algorithmischen Geometrie (9 ECTS)**, *University of Bonn*.
 Bachelor Informatik
 Co-taught with: Herman Haverkort
- 2018 **Algorithmic Aspects of Data Science (5 ECTS)**, *TU Eindhoven*.
 Bachelor Computer Science
 Co-taught with: Herman Haverkort
 ★ **Course was newly developed**
- 2017 **Foundations of data mining (5 ECTS)**, *TU Eindhoven*.
 Master Computer Science
 Co-taught with: Joaquin Vanschoren and Vlado Menkovski
- 2016 **Foundations of data mining (5 ECTS)**, *TU Eindhoven*.
 Master Computer Science
 Co-taught with: Joaquin Vanschoren and Mykola Pechenizkiy
 ★ **Course was newly developed**

Supervision

- Jacobus Conradi**, *Ongoing*.
 Doctoral student, Computational Geometry, University of Bonn
- Frederik Brüning**, *Ongoing*.
 Doctoral student, Computational Geometry, University of Bonn
- 2019–2021 **Ioannis Psarros**.
 Postdoc, Hausdorff Center for Mathematics
- 2021 **David Göckede**, *Master thesis, Computer Science, University of Bonn*.
 Thesis: *Computing the Fréchet distance in graphs efficiently using shortest-path distance oracles*
- 2020 **Jan Maik Hitschke**, *Master thesis, Mathematics, University of Bonn*.
 Thesis: *Center curves under the Fréchet distance and their computability*
- 2020 **Carolyn Kaffine**, *Master thesis, Mathematics, University of Bonn*.
 Thesis: *On the VC Dimension of Bisector Ranges Defined on Curves*
- 2020 **Koen van Greevenbroek**, *Master thesis, Mathematics, University of Bonn*.
 Thesis: *Averaging curves under the dynamic time warping distance*
- 2020 **Jacobus Conradi**, *Master thesis, Mathematics, University of Bonn*.
 Thesis: *k-shortcut Fréchet distance: Hardness and Approximation*
 ★ **Thesis-award by Bonner Informatik Gesellschaft (BIG)**
- 2019 **Natasja van de l’Isle**, *Master thesis, Computer Science, TU Eindhoven*.
 Thesis: *Algorithms for center-based trajectory clustering*
 Co-supervised with Kevin Buchin
- 2018 **Martijn Struijs**, *Master thesis, Mathematics, TU Eindhoven*.
 Thesis: *Curve clustering: hardness and algorithms*
 Co-supervised with Kevin Buchin and Jesper Nederlof

2014–2018 **Amer Krivošija**, *Doctoral thesis, TU Dortmund*.
Thesis: *On clustering and related problems on curves under the Fréchet distance*
Co-supervised with Christian Sohler, Thesis completed in 2021

Publications

(author ordering is alphabetical)

Refereed Conference Publications

- [1] Anne Driemel and Ioannis Psarros. ANN for time series under the fréchet distance. In *Algorithms and Data Structures - 17th International Symposium, WADS 2021, Virtual Event, August 9-11, 2021, Proceedings*, pages 315–328, 2021.
- [2] Maike Buchin, Anne Driemel, and Dennis Rohde. Approximating (k,l)-median clustering for polygonal curves. In *Proceedings of the 2021 ACM-SIAM Symposium on Discrete Algorithms, SODA 2021, Virtual Conference, January 10 - 13, 2021*, pages 2697–2717, 2021.
- [3] Kevin Buchin, Anne Driemel, and Martijn Struijs. On the hardness of computing an average curve. In *17th Scandinavian Symposium and Workshops on Algorithm Theory, SWAT 2020, June 22-24, 2020, Tórshavn, Faroe Islands*, pages 19:1–19:19, 2020.
- [4] Anne Driemel, Jeff M. Phillips, and Ioannis Psarros. The VC dimension of metric balls under Fréchet and Hausdorff distances. In *Proceedings of the 35th International Symposium on Computational Geometry, SoCG*, pages 28:1–28:16, 2019.
- [5] Kevin Buchin, Anne Driemel, Joachim Gudmundsson, Michael Horton, Irina Kostitsyna, Maarten Löffler, and Martijn Struijs. Approximating (k,l)-center clustering for curves. In *Proceedings of the Thirtieth Annual ACM-SIAM Symposium on Discrete Algorithms, SODA*, pages 2922–2938, 2019.
- [6] Matteo Ceccarello, Anne Driemel, and Francesco Silvestri. FRESH: Fréchet similarity with hashing. In *Proceedings of Algorithms and Data Structures - 16th International Symposium, WADS*, pages 254–268, 2019.
- [7] Anne Driemel and Amer Krivosija. Probabilistic embeddings of the Fréchet distance. In *Approximation and Online Algorithms - 16th International Workshop, WAOA 2018*, pages 218–237, 2018.
- [8] Peyman Afshani and Anne Driemel. On the complexity of range searching among curves. In *Proceedings of the 29th ACM-SIAM Symposium on Discrete Algorithms, SODA*, pages 898–917, 2018.
- [9] Anne Driemel and Francesco Silvestri. Locality-sensitive hashing of curves. In *Proceedings of the 33rd International Symposium of Computational Geometry, SoCG*, pages 37:1–37:16, 2017.
- [10] Anne Driemel, Amer Krivošija, and Christian Sohler. Clustering time series under the Fréchet distance. In *Proceedings of the 27th ACM-SIAM Symposium on Discrete Algorithms, SODA*, pages 766–785, 2016.
- [11] Maike Buchin, Anne Driemel, and Bettina Speckmann. Computing the Fréchet distance with shortcuts is NP-hard. In *Proceedings of the 30th Symposium on Computational Geometry, SoCG*, pages 367–376, 2014.

- [12] Boris Aronov, Anne Driemel, Marc van Kreveld, Maarten Löffler, and Frank Staals. Segmentation of trajectories on non-monotone criteria. In *Proceedings of the 24th ACM-SIAM Symposium on Discrete Algorithms, SODA*, 2013.
- [13] Anne Driemel, Sariel Har-Peled, and Benjamin Raichel. On the expected complexity of Voronoi diagrams on terrains. In *Proceedings of the 28th ACM Symposium on Computational Geometry, SoCG*, pages 101–110, 2012.
- [14] Anne Driemel and Sariel Har-Peled. Jaywalking your dog: computing the Fréchet distance with shortcuts. In *Proceedings of the 23rd Annual ACM-SIAM Symposium on Discrete Algorithms, SODA*, pages 318–337, 2012.
- [15] Atlas F. Cook, Anne Driemel, Sariel Har-Peled, Jessica Sherette, and Carola Wenk. Computing the Fréchet distance between folded polygons. In *Algorithms and Data Structures - 12th International Symposium, WADS*, pages 267–278, 2011.
- [16] Anne Driemel, Herman Haverkort, Maarten Löffler, and Rodrigo I. Silveira. Flow computations on imprecise terrains. In *Algorithms and Data Structures - 12th International Symposium, WADS*, pages 350–361, 2011.
- [17] Daniel Chen, Anne Driemel, Leonidas J. Guibas, Andy Nguyen, and Carola Wenk. Approximate map matching with respect to the Fréchet distance. In *Proceedings of the Workshop on Algorithm Engineering and Experiments, ALENEX*, pages 75–83, 2011.
- [18] Maike Buchin, Anne Driemel, Marc van Kreveld, and Vera Sacristán. An algorithmic framework for segmenting trajectories based on spatio-temporal criteria. In *18th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*, pages 202–211, 2010.
- [19] Anne Driemel, Sariel Har-Peled, and Carola Wenk. Approximating the Fréchet distance for realistic curves in near linear time. In *Proceedings of the 26th ACM Symposium on Computational Geometry, SoCG*, pages 365–374, 2010.

Refereed Journal Publications

- [20] Anne Driemel, André Nusser, Jeff M. Phillips, and Ioannis Psarros. The VC dimension of metric balls under Fréchet and Hausdorff distances. 2021.
- [21] Anne Driemel, Sariel Har-Peled, and Benjamin Raichel. On the expected complexity of Voronoi diagrams on terrains. *ACM Transactions on Algorithms*, 12(3):37:1–37:20, April 2016.
- [22] Boris Aronov, Anne Driemel, Marc Van Kreveld, Maarten Löffler, and Frank Staals. Segmentation of trajectories on nonmonotone criteria. *ACM Transactions on Algorithms*, 12(2):26:1–26:28, December 2015.
- [23] Atlas F. Cook IV, Anne Driemel, Jessica Sherette, and Carola Wenk. Computing the Fréchet distance between folded polygons. *Computational Geometry*, 50:1 – 16, 2015.
- [24] Anne Driemel and Sariel Har-Peled. Jaywalking your dog: computing the Fréchet distance with shortcuts. *SIAM Journal on Computing*, 42(5):1830–1866, 2013.
- [25] Anne Driemel, Herman Haverkort, Maarten Löffler, and Rodrigo Silveira. Flow computations on imprecise terrains. *Journal of Computational Geometry*, 4(1):38–78, 2013.

- [26] Anne Driemel, Sariel Har-Peled, and Carola Wenk. Approximating the Fréchet distance for realistic curves in near linear time. *Discrete & Computational Geometry*, 48(1):94–127, 2012.
- [27] Maike Buchin, Anne Driemel, Marc van Kreveld, and Vera Sacristán. Segmenting trajectories: A framework and algorithms using spatiotemporal criteria. *Journal of Spatial Information Science*, 3(1):33–63, 2011.

Theses

- [28] Anne Driemel. *Realistic analysis for algorithmic problems on geographical data*. PhD thesis, Utrecht University, 2013.
- [29] Anne Driemel. Multiscale curvature matching for smooth polylines. Master's thesis, Free University of Berlin, 2009.