Sebastian Wild

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October 15, 2019

Employment

since 2019 **Lecturer** (assistant professor)
Department of Computer Science · University of Liverpool

2017–2019 **Postdoctoral Fellow and Sessional Instructor**
David R. Cheriton School of Computer Science · University of Waterloo

2012–2017 ***Wissenschaftlicher Mitarbeiter*** (research assistant)
Department of Computer Science · University of Kaiserslautern

paternal leave for 6 months (Dec. 2013 – Jan. 2014, May – June 2015, Nov. – Dec. 2016)

Education

Dr. rer. nat. (equiv. to **Ph. D.**) Department of Computer Science, University of Kaiserslautern, 2016
Dissertation Title: *Dual-Pivot Quicksort and Beyond: Analysis of Multiway Partitioning and Its Practical Potential*

M. Sc. Department of Computer Science, University of Kaiserslautern, 2012

B. Sc. Department of Computer Science, University of Kaiserslautern, 2010

Publications

Preprints and details at www.wild-inter.net/publications.
(Titles are clickable links).

Peer-Reviewed Conference Papers

[c10] *Efficient Second-Order Shape-Constrained Function Fitting*
David Durfee, Yu Gao, Anup B. Rao, and Sebastian Wild
Algorithms and Data Structures Symposium (WADS) 2019

[c9] *Sesquickselect: One and a half pivots for cache-efficient selection*
Conrado Martínez, Markus E. Nebel, and Sebastian Wild
Meeting on Analytic Algorithmics and Combinatorics (ANALCO) 2019

[c8] *Median-of-k Jumplists and Dangling-Min BSTs*
Markus E. Nebel, Elisabeth Neumann, and Sebastian Wild
Meeting on Analytic Algorithmics and Combinatorics (ANALCO) 2019

[c7] *Nearly-Optimal Mergesorts: Fast, Practical Sorting Methods That Optimally Adapt to Existing Runs*
J. Ian Munro and Sebastian Wild
European Symposium on Algorithms (ESA) 2018
in Y. Azar, H. Bast, G. Herman (Eds.): ESA 2018, LIPIcs 112, Dagstuhl, 2018, 63:1-63:16

[c6] *Average Cost of QuickXsort with Pivot Sampling*
Sebastian Wild
International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA) 2018
Ward M. D., Fill J. A. (eds.): AofA 2018, LIPIcs vol. 110, pp 36:1–36:19

[c5] *Quicksort Is Optimal for Many Equal Keys*
Sebastian Wild
Meeting on Analytic Algorithmics and Combinatorics (ANALCO) 2018
Nebel M., Wagner S. (eds.): ANALCO 2018, SIAM, pp 8–22

[c4] *Analysis of Branch Misses in Quicksort*
Conrado Martínez, Markus E. Nebel, and Sebastian Wild
Meeting on Analytic Algorithmics and Combinatorics (ANALCO) 2015
Sedgewick R., Ward M. D. (eds.): ANALCO 2015, SIAM, pp 114–128

[c3] *Pivot Sampling in Dual-Pivot Quicksort*
Markus E. Nebel and Sebastian Wild
International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA) 2014
Bousquet-Mélou M., Soria M. (eds.): DMTCS-HAL Proceedings Series, vol. BA, pp 325–338

[c2] *Engineering Java 7's Dual Pivot Quicksort Using MaLiJan*
Sebastian Wild, Markus E. Nebel, Raphael Reitzig, and Ulrich Laube
Meeting on Algorithm Engineering and Experiments (ALENEX) 2013
Sanders P., Zeh N. (eds.): ALENEX 2013, SIAM, pp 55–69

[c1] *Average Case Analysis of Java 7's Dual Pivot Quicksort*
Sebastian Wild and Markus E. Nebel
European Symposium on Algorithms (ESA) 2012
Epstein L. and Ferragina P. (eds.): ESA 2012, LNCS 7501, Springer, pp 825–836.

Peer-Reviewed Journal Articles

[j5] *Building Fences Straight and High: An Optimal Algorithm for Finding the Maximum Length You Can Cut k Times from Given Sticks*
Raphael Reitzig and Sebastian Wild
Algorithmica 80, 11, pp 3365–3396 **(2018)**

[j4] *Analysis of Pivot Sampling in Dual-Pivot Quicksort*
Markus E. Nebel, Sebastian Wild, and Conrado Martínez
Algorithmica 75, 4, pp 632–683, **(2016)**

[J3] *Analysis of Quickselect under Yaroslavskiy's Dual-Pivoting Algorithm*
Sebastian Wild, Markus E. Nebel, and Hosam Mahmoud
Algorithmica 74, 1, pp 485–506, **(2016)**

[J2] *Average Case and Distributional Analysis of Dual Pivot Quicksort*
Sebastian Wild, Markus E. Nebel, and Ralph Neininger
ACM Transactions on Algorithms 11, 3, article 22, **(2015)**

[J1] *JAguc – A Software Package for Environmental Diversity Analyses*
Markus E. Nebel, Sebastian Wild, Michael Holzhauser, Lars Hüttenberger, Raphael Reitzig, Matthias Sperber, and Thorsten Stoeck
Journal of Bioinformatics and Computational Biology 9, 6, pp 749–773, **(2011)**

Textbooks

[B1] *Entwurf und Analyse von Algorithmen*
(Design and Analysis of Algorithms)
Markus Nebel and Sebastian Wild · ***Springer Vieweg*** · **2018**

Theses

[T3] *Dual-Pivot Quicksort and Beyond: Analysis of Multiway Partitioning and Its Practical Potential*
Dissertation · University of Kaiserslautern · **2016**

[T2] *Java 7's Dual Pivot Quicksort*
Master's Thesis · University of Kaiserslautern · **2012**

[T1] *An Earley-style Parser for Solving the RNA-RNA Interaction Problem*
Bachelor's Thesis · University of Kaiserslautern · **2010**

Manuscripts in Preparation & Working Papers

[M5] *Dynamic Optimality Refuted – For Tournament Heaps*
J. Ian Munro, Richard Peng, Sebastian Wild, and Lingyi Zhang

[M4] *Entropy Trees and Range-Minimum Queries In Optimal Average-Case Space*
J. Ian Munro, and Sebastian Wild

[M3] *QuickXsort – A Fast Sorting Scheme in Theory and Practice*
Stefan Edelkamp, Armin Weiß, and Sebastian Wild

[M2] *A Practical and Worst-Case Efficient Algorithm for Divisor Methods of Apportionment*
Raphael Reitzig and Sebastian Wild

[M1] *Reputation-Based Cooperation in Local Interaction: Evolution of Indirect Reciprocity with Minimal Memory* · Jano Costard, Sándor P. Fekete, Hella-Franziska Hoffmann, Alexander Koch, Dominik Leipold, Jonas Radbruch, Maximilian Schlund, Jann Spiess, Paul Stursberg, and Sebastian Wild

Other Publications

[O3] *Dual-pivot and beyond: The potential of multiway partitioning in quicksort*
Sebastian Wild
Distinguished Dissertations in *it – Information Technology*, vol 60, 3, pp 173–177

[O2] *Quicksort mit zwei Pivots und mehr* · Sebastian Wild
GI LNI Dissertations Band 17 – Ausgezeichnete Informatikdissertationen 2016

[O1] *Why is Dual-Pivot Quicksort Fast?* · Sebastian Wild
extended abstract for *Theorietage 2015* (GI Workshop on Algorithms)

Awards and Honors

2017 ***GI Dissertationspreis 2016*** · [T3]
Prize for **best dissertation** in computer science 2016 in Germany, Austria, and Switzerland, jointly awarded by *GI*, *SI*, and *OCG*

2017 Nominated for ***Distinguished Teaching Award 2017*** of *University of Kaiserslautern* for the design of the interactive course *Training für Programmierwettbewerbe*

2013 *Preis des Freundeskreises der TU Kaiserslautern* · [T2]
Best Master's Thesis in the Department of Computer Science 2012

2012 **Best Paper Award** at the *European Symposium on Algorithms 2012* · [C1]

2009–2012 **Scholarship** of the German National Academic Foundation

Talks

Slides available at www.wild-inter.net/publications.

Invited Talks

2019 *"Dual-Pivot Quicksort and Beyond: An Analysis-of-Algorithms Perspective on Multiway Quicksort"*
Computability in Europe 2019 · Special Session *Smoothed and Probabilistic Analysis of Algorithms*
Durham University · 17 Jul. 2019

2018 *"Succinct Data Structures For Range Minimum Problems"*
NSF Center for Science of Information · Purdue University · 24 Oct. 2018

2017 *"Dual-Pivot Quicksort and Beyond"*
Annual SPP Meeting of the *DFG Schwerpunktprogramm Algorithms for Big Data*
19 Oct. 2017

2016 *"Dual-Pivot Quicksort and Beyond"*
Research Seminar · ***Hasso-Plattner-Institut Potsdam*** · 6 Sep. 2016

Conference & Workshop Presentations

2019 *"Second-Order Shape-Constrained Function Fitting"* · [C10]
WADS 2019 · 6 Aug. 2019

2019 *"Compressed Range-Minimum Queries: Average-Case Analysis of Search Trees Meets Space-Efficient Data Structures"* · [M4]
AofA Meeting · 24 Jun. 2019

2019 *"Entropy Trees & Range-Minimum Queries In Optimal Average-Case Space"* · [M4]
Dagstuhl Seminar 19 051 (Data Structures for the Cloud and External Memory Data)
28 Jan. 2019

2019 *"Sesquickselect: One and a half pivots for cache-efficient selection"* · [C9]
ANALCO Conference · 06 Jan. 2019

2018 *"Nearly-optimal Mergesorts"* · [C7]
ESA Conference · 20 Aug. 2018

2018 *"Average Cost of QuickXsort with Pivot Sampling"* · [C6]
AofA Conference · 28 June 2018

2018 *"Quicksort Is Optimal for Many Equal Keys"* · [C5]
ANALCO Conference · 8 Jan. 2018

2017 *"Median-of-k Quicksort is optimal for many equal keys"*
AofA Meeting · 19 June 2017

2016 *"Quicksort with Equal Keys"*
Dagstuhl Seminar 16 101 (Data Structures and Advanced Models of Computation on Big Data)
7 March 2016

2015 *"Why is Dual-Pivot Quicksort Fast?"* · [O1]
GI Theorietage (Workshop) · 29 Sept. 2015

2015 *"Analysis of Branch Misses in Quicksort"* · [C4]
ANALCO Conference · 4 Jan. 2015

2014 *"Pivot Sampling in Dual-Pivot Quicksort"* · [C3]
AofA Conference · 16 June 2014

2014 *"Dual-Pivot Quicksort – Asymmetries in Sorting"*
Dagstuhl Seminar 14 091 (Data Structures and Advanced Models of Computation on Big Data)
25 March 2014

2013 *"Engineering Java 7's Dual Pivot Quicksort Using MaLiJAn"* · [C2]
ALENEX Conference · 7 Jan. 2013

2013 *"Quickselect Under Yaroslavskiy's Dual-Pivoting Algorithm"*
AofA Meeting · 28 May 2013

2013 *"Java 7's Dual Pivot Quicksort"*
FORMAT Workshop · 9 April 2013

2012 *"Average Case Analysis of Java 7's Dual Pivot Quicksort"* · [C1]
ESA Conference · 11 Sept. 2012

Departmental Talks

2017 *"Dual-Pivot Quicksort and Beyond"* · University of Waterloo · 1 November 2017

2015 *"Dual-Pivot Quicksort"* · University of Kaiserslautern · 24 March 2015

Teaching Experience

Details on courses and teaching evaluations at www.wild-inter.net/teaching.
(Titles are clickable links).

Instructor of Record

Sole responsibility for course (give lectures, design assignments, take/design exams).

2018 *Data Structures and Data Management (CS 240)* · undergraduate level

2017 *Advanced Algorithmics: Strategies for Hard Problems* · advanced graduate level

2017 *Competitive Programming* · undergraduate level

2016/17 *Algorithms and Data Structures* · undergraduate level, non-CS majors

Teaching Assistance

Responsible for tutorials (recruit student tutors, design assignments and exams, give exercise classes).

2015/16
2014 *Introduction to the Mathematical Analysis of Algorithms*
(original title: *Algorithm Engineering*) · advanced graduate level

2013/14 *Computational Biology I: Alignments and Sequencing*
advanced undergraduate level

2015/16
2014
2012/13 *Computational Biology II: Signals, Phylogenetics and Structure Prediction*
graduate level

2014/15 *Design and Analysis of Algorithms* · intermediate undergraduate level

2013 *Combinatorial Algorithms: String Search, Compression, Networks, and Random Generation* · advanced undergraduate level

2013/14
2012/13 *Proof Techniques* · tutorial at introductory undergraduate level

Student Tutor

(grade assignments, give exercise class).

Formal Foundations of Programming · *Software Development I: Introduction to Programming* · *Software Development III: Concurrency and Parallel Programming*

Supervised Students

Bachelor's Theses

2016 Marvin Peterson · Title: *Experimental View on Cache Behavior of Search Trees*

2015 Elisabeth Neumann · Title: *Randomized Jumplists With Several Jump Pointers* · [c8]

Service

To Profession

Program committees ESA 2019 · ANALCO 2019 · ANALCO 2018

Review (journals) *ACM Journal of Experimental Algorithmics* · *ACM Transactions on Algorithms* · *Algorithmica* · *Bulletin of Mathematical Biology* · *Combinatorics, Probability & Computing* · *IEEE Transactions on Computers* · *Information Processing Letters* · *International Journal of Computer Mathematics* · *Mathematics in Computer Science* · *Software: Practice and Experience* · *The Computer Journal* · *Theoretical Computer Science*

Review (conferences) SODA 2020 · SOFSEM 2020 · SPAA 2019 · SEA 2018 · WADS 2017 · SEA 2017 · ANALCO 2017 · AofA 2016 · SWAT 2014 · ANALCO 2014 · ESA 2013

To Department

Representative of Scientific Employees in **Examination Board** · 2012 – 2017

Additional Training

2017 *Teaching Development Seminar Series for Postdocs*
Centre for Teaching Excellence, University of Waterloo · 6 – 10 Nov. 2017

2016 *Lehre 2.0 – Lehren mit dem Internet*
Workshop on including social media in teaching · 13 June 2016

2015 *Meetings und Projektbesprechungen effizient und zielgerichtet leiten*
Workshop on how to effectively chair a group meeting · 9 – 10 April 2015

Nonacademic Work Experience

Java Developer *marketmaker Software AG* (since 2012 part of *vwd Vereinigte Wirtschaftsdienste GmbH*)
Jul 2010 – Apr 2012 in term breaks

Developed server components for a web-based financial market-data solution.

Languages

German native

English fluent

French elementary