

# Sebastian Wild

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## Education

- Dr. rer. nat.** Department of Computer Science, University of Kaiserslautern, 2016  
(equiv. to Ph.D.) 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

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## Publications

Preprints and details at [wild-inter.net](http://wild-inter.net).  
(Titles are clickable links).

### 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* online early access, (2017)
- [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)

*Peer-Reviewed Conference Papers*

- [c9] *Sesquiselect: 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*  
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.

## 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

- [P3] *QuickXsort – A Fast Sorting Scheme in Theory and Practice*  
Stefan Edelkamp, Armin Weiß, and Sebastian Wild
- [P2] *A Practical and Worst-Case Efficient Algorithm for Divisor Methods of Apportionment*  
Raphael Reitzig and Sebastian Wild
- [P1] *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)

## Honors and Awards

- 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
- 2013** *Preis des Freundeskreises der TU Kaiserslautern* · [T2]  
**Best Master's Thesis** of the Department 2012
- 2012** **Best Paper Award** at the *European Symposium on Algorithms 2012* · [C1]
- 2009–2012** **Scholarship** of German National Academic Foundation

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## Talks

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*Slides available on slideshare.net.*

### Invited Talks

- 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

- 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” · TU Kaiserslautern · 24 March 2015

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## Teaching Experience

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### Instructor of Record

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

- 2018**    *Data Structures and Data Management (CS240)* · undergraduate level  
**2017**    *Advanced Algorithmics: Strategies for Hard Problems* · advanced graduate level  
**2017**    *Competitive Programming* · undergraduate level  
**2016/17**    *Algorithms and Data Structures* · introductory undergraduate level, non-CS majors

### Teaching Assistance

Responsible for tutorials (recruit student tutors, design exercise and exam problems, give exercise classes).

- 2015/16**    *Introduction to the Mathematical Analysis of Algorithms*  
**2014**    (original title: *Algorithm Engineering*) · advanced graduate level  
**2013/14**    *Computational Biology I: Alignments and Sequencing* · advanced undergraduate level  
**2015/16**    *Computational Biology II: Signals, Phylogenetics and Structure Prediction*  
**2014**    graduate level  
**2012/13**  
**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**    *Proof Techniques* · short tutorial, introductory undergraduate level  
**2012/13**

### Tutor Positions

Student Tutor (grade students' solutions, give exercise class).

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

## Supervised Theses

### *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*

## Service

### *To Profession*

- Program committees** ANALCO 2018, ANALCO 2019
- Review (journals)** *ACM Journal of Experimental Algorithmics* · *Bulletin of Mathematical Biology* · *Combinatorics, Probability & Computing* · *IEEE Transactions on Computers* · *Information Processing Letters* · *International Journal of Computer Mathematics* · *Software: Practice and Experience* · *The Computer Journal*
- Review (conferences)** 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

- 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.

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## Languages

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**German**    native tongue

**English**    fluently written and spoken

**French**    elementary