Sebastian Berndt

Research Areas: approximation algorithms, FPT algorithms, cryptography
Publications: AAAI, APPROX, CCS, ESA, EUROCRYPT, SEA, ... (Link)
Teaching: Algorithms and Datastructures, Algorithm Design, IT-Security, Coding Theory (Link)
Education: BSc, MSc, Ph.D. (Link)

Education

2010 BSc in Computer Science, Kiel University
2012 MSc in Computer Science, Kiel University
2018 Ph.D. in Computer Science, "New Results on Feasibilities and Limitations of Provable Secure Steganography", Advisor: Prof. Dr. Maciej Liśkiewicz (summa cum laude)

Employment

2012–2017 Research Associate, Ph.D. Student, Institute for Theoretical Computer Science (Prof. Dr. Rüdiger Reischuk), University of Lübeck
2017– Research Associate, Department of Computer Science (Prof. Dr. Klaus Jansen), Kiel University

Awards

2016 Best Student Paper Award for "Provable Secure Universal Steganography of Optimal Rate"
2016 Third place in the tracks »sequential exact solver« and »parallel heuristic solver« in the first *PACE* challenge on parameterized algorithms
2017 Third place in »Track A: Treewidth« in the second *PACE* challenge on parameterized algorithms
2018 Best Student Paper Award for "Practical Access to Dynamic Programming on Tree Decompositions"

Talks

2015a "Learnability does not imply Secure Steganography", Nordic Complexity Workshop
2015b "Fully Dynamic Bin Packing Revisited", Approximation Algorithms and Parameterized Complexity
2016a "Computing tree decompostions via SAT solvers", Kiel University
2016b "On the Relation between Steganography and Cryptography", Information Security Seminar, Queensland University of Technology
2017 "The PACE challenge: practical algorithms for tree width", Universidad de Chile
2018 "Computing Tree Width: Theory and Practice", University of Bergen

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Publications

Conference Proceedings

2015 Berndt, Sebastian and Jansen, Klaus and Klein, Kim-Manuel* (2015),
"Fully Dynamic Bin Packing Revisited", *APPROX/RANDOM 2015*

2016a Berndt, Sebastian and Reischuk, Rüdiger (2016),
"Steganography Based on Pattern Languages", *LATA 2016*

2016b Berndt, Sebastian and Liśkiewicz, Maciej (2016),
"Provable Secure Universal Steganography of Optimal Rate", *ACM IH&MMSEC 2016*
Awarded Best Student Paper

2016c Berndt, Sebastian and Liśkiewicz, Maciej (2016),
"Hard Communication Channels for Steganography", *ISAAC 2016*

2017a Berndt, Sebastian and Liśkiewicz, Maciej and Lutter, Matthias* and Reischuk, Rüdiger (2017),
"Learning Residual Alternating Automata", *AAAI 2017*

2017b Bannach, Max* and Berndt, Sebastian and Ehlers, Thorsten* (2017),
"Jdrasil: A Modular Library for Computing Tree Decompositions", *SEA 2017*

2017c Berndt, Sebastian and Liśkiewicz, Maciej (2017),
"Algorithm Substitution Attacks from a Steganographic Perspective", *CCS 2017*

2018a Berndt, Sebastian and Liśkiewicz, Maciej (2018),
"On the Gold Standard for Security of Universal Steganography", *EUROCRYPT 2018*

2018b Berndt, Sebastian (2018),
"Computing Tree Width: From Theory to Practice and Back", *CIE 2018*

2018c Berndt, Sebastian and Klein, Kim-Manuel (2018),
"Using Structural Properties for Integer Programs", *CIE 2018*

2018d Bannach, Max* and Berndt, Sebastian (2018),
"Practical Access to Dynamic Programming on Tree Decompositions", *ESA 2018*
Awarded Best Student Paper (Track B)

2019a Bannach, Max* and Berndt, Sebastian (2019),
"Positive-Instance Driven Dynamic Programming for Graph Searching", *WADS 2019*

2019b Berndt, Sebastian and Epstein, Leah and Jansen, Klaus and Levin, Asaf and Maack, Marten* and Rohwedder, Lars* (2019),
"Online Bin Covering with Limited Migration", *ESA 2019*

2019c Berndt, Sebastian and Dreismann, Valentin† and Grage, Kilian* and Jansen, Klaus and Knof, Ingmar† (2019),
"Robust Online Algorithms for Certain Dynamic Packing Problems", *WAOA 2019*

Journal Publications

2018 Berndt, Sebastian and Klein, Kim-Manuel and Jansen, Klaus (2018),
"Fully Dynamic Bin Packing Revisited", *Math. Program. 2018* (accepted)
preliminary version was presented at *APPROX/RANDOM 2015*

Non-Peer-Reviewed Works

2018 Bannach, Max* and Berndt, Sebastian and Ehlers, Thorsten* and Nowotka, Dirk (2018),
"SAT-Encodings of Tree Decompositions", *SAT COMPETITION 2018*

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*This author was a Ph. D. student at time of writing
†This author was a M. Sc. student at time of writing

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Teaching

- Teaching Assistant for ”Algorithm Design” in 2012, 2013, 2014, 2015, and 2016 teaching tutorials and some of the lectures (Lübeck)
- Teaching Assistant for ”Introduction to IT Security and Reliability” in 2012, 2013, 2014, 2015, and 2016 teaching tutorials and some of the lectures (Lübeck)
- Teaching Assistant for ”Coding and Security” in 2013, 2014, 2015, and 2016 teaching tutorials and some of the lectures (Lübeck)
- Lecturer for ”Presentation and Documentation” in 2015 teaching four lectures (Lübeck)
- Teaching Assistant for ”Introduction to Operations Research” in 2017 and 2018 teaching tutorials (Kiel)
- Teaching Assistant for ”Algorithms and Datastructures” in 2018 and 2019 teaching tutorials and organizing the tutorials (Kiel)
- Lecturer for ”Online Algorithms” in 2018 teaching and designing the lectures (Kiel)
- Lecturer for ”Introduction to Math for Dual-Subject Students” in 2018 teaching and designing the lectures (Kiel)

Supervised Theses

2015a Bachelor Thesis on ”Lower Bounds in Online Bin Packing Models”
2015b Bachelor Thesis on ”Secure Multiparty Computations in Bitcoin”
2015c Bachelor Thesis on ”Development and Examination of a Huffman-coding based Stegosystem”
2018a Bachelor Thesis on ”Mobility 4.0 - Optimizing Vehicle Planning by Scheduling Algorithms”
2018b Bachelor Thesis on ”Sensitivity Analysis with the Steinitz Lemma”
2019a Master Thesis on ”Amortised Migration for Maximization Problems”
2019b Bachelor Thesis on ”Deterministic Algorithms for Discrepancy Minimization”

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Extracurricular Activities

2012–2015 Received the "*Teaching Certificate II*" by taking more than 10 courses in e.g. team leading, presentation techniques and others (Link)
2016 Organizing Commitee of *Creative Mathematical Sciences Communication* (Link)
2016 Taught a week-long summer course on algorithms to a group of pupils from age 14 to 17 based on *Computer Science Unplugged* (Link)
2016 Developed the tool *Jdrasil* to compute tree decompositions (Link)
2018 Taught a day-long course on algorithmics in the context of the "Girls' Day" for female pupils from age 14 to 15 (Link)
2017 Co-wrote a grant proposal on parameterized scheduling problems
2018 Taught four lectures of one hour to a group of pupils (Link)
2018 Co-organized the annual "day of business informatics" (Link)
2019 Deputy Member of the "Study Committee" (Studienausschuss) of the Department of Computer Science of Kiel University

Academic Service

- I was an external reviewer for the following conferences: *STOC*, *SODA*, *ESA*, *ICALP*, *ISAAC*, *STACS*, *IPDPS*, *ALT*, *WG*, *LATIN*, *WAOA*, *SOFSEM*, *CIE*, *OPTA*
- I was a reviewer for the following journals: *Algorithmica*, *JAIR*, *JEA*, *Journal of Combinatorial Optimization*

Last updated: July 22, 2019 • Typeset in XeLaTeX

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