Sebastian Berndt

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

Education

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

Employment

2020–	Research Associate, Institute for IT Security (Prof. Dr. Thomas Eisenbarth), University of Lübeck
2017–2020	Research Associate, Department of Computer Science (Prof. Dr. Klaus Jansen), Kiel University
2012–2017	Research Associate, Ph.D. Student, Institute for Theoretical Computer Science (Prof. Dr. Rüdiger Reischuk), University of Lübeck

Awards

2020	Fourth place (out of 15) in the exact track and fifth place (out of 10) in the heuristic tracks of the *PACE* challenge on parameterized algorithms (both descriptions chosen to appear in *IPEC* proceedings)
2018	Best Student Paper Award for "Practical Access to Dynamic Programming on Tree Decompositions"
2017	Third place in »Track A: Treewidth« in the second *PACE* challenge on parameterized algorithms
2016	Third place in the tracks »sequential exact solver« and »parallel heuristic solver« in the first *PACE* challenge on parameterized algorithms
2016	Best Student Paper Award for "Provable Secure Universal Steganography of Optimal Rate"

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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

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*

2020a   Bannach, Max and Berndt, Sebastian and Maack, Marten† and Mnich, Matthias and Lassota,

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*The authors are alphabetically sorted
†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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Alexandra† and Rau, Malin and Skambath, Malte†*,
"Solving Packing Problems with Few Small Items Using Rainbow Matchings", *MFCS 2020*

2020b   Seker, Okan† and Berndt, Sebastian and Wilke, Luca† and Eisenbarth, Thomas,
"SNI-in-the-head: Protecting MPC-in-the-head Protocols against Side-channel Analysis", *CCS 2020*

Journal Publications

2018   Berndt, Sebastian and Klein, Kim-Manuel and Jansen, Klaus (2018),
"Fully Dynamic Bin Packing Revisited", *Math. Program. 2020* 179
preliminary version was presented at *APPROX/RANDOM 2015*

2019   Bannach, Max† and Berndt, Sebastian (2019),
"Practical Access to Dynamic Programming on Tree Decompositions", *Algorithms 2019* 12(8), 172
preliminary version was presented at *ESA 2018*

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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*

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)
- Lecturer for "Secure Networks and Computer Forensics" in 2020 teaching the forensics lectures (Lübeck)

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" (now a Ph. D. student at Lübeck)
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" (now a Ph. D. student in Göttingen)
2019b	Bachelor Thesis on "Deterministic Algorithms for Discrepancy Minimization"
2020	Master Thesis on "Algorithms for Mixed Integer Linear Programs" (now a Ph. D. student in Saarbrücken)

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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

2020 Taught a week-long summer course on IT security to a group of pupils from age 14 to 17 ([Link](#))

Academic Service

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

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