

Curriculum Vitae
Steffen Bondorf
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Norwegian University of Science and Technology (NTNU) Trondheim
Faculty of Information Technology and Electrical Engineering
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EDUCATION

- Dr.-Ing. Computer Science, University of Kaiserslautern, 2016,
Thesis title: Worst-Case Performance Analysis of Feed-Forward Networks –
An Efficient and Accurate Network Calculus
Supervisor: Prof. Dr. Jens B. Schmitt (University of Kaiserslautern)
Additional
Reviewers: Prof. Dr. Roland Meyer (formerly TU Kaiserslautern,
now Braunschweig University of Technology)
Dr. Marc Boyer (ONERA, the French Aerospace Lab)
Grade: Summa Cum Laude (with distinction)
- M.Sc. Computer Science, University of Kaiserslautern, 2012,
Thesis title: Performance Modeling of Energy-Harvesting
Wireless Sensor Networks
Supervisor: Prof. Dr. Jens B. Schmitt
- B.Sc. Computer Science, University of Kaiserslautern, 2009,
Thesis title: Statistical Performance Bounds in Wireless Sensor Networks with
Random Topology
Supervisor: Prof. Dr. Jens B. Schmitt
- Abitur Veldenz Gymnasium Lauterecken, Lauterecken, Germany, 2006,
Majors: Computer Science, Mathematics, English, Social Studies
- Frühstudium Computer Science, TU Kaiserslautern, 2005 – 2006,
first student to be admitted to the Department of Computer Science's
undergraduate studies before finishing secondary education.

PUBLICATIONS

Conference Proceedings (Peer-Reviewed)

- 2019 DeepTMA: Predicting Effective Contention Models for Network Calculus using Graph Neural Networks
Fabien Geyer and **Steffen Bondorf**
Accepted to the 38th IEEE International Conference on Computer Communications (INFOCOM '19), April 2019. Acceptance rate 19.7%, CORE A*.
- 2019 Cross-Sender Bit-Mixing Coding
Steffen Bondorf, Binbin Chen, Jonathan Scarlett, Haifeng Yu and Yuda Zhao
Accepted to the 18th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN '19), April 2019. Acceptance rate 27.5%, CORE A*.
- 2018 The Deterministic Network Calculus Analysis: Reliability Insights and Performance Improvements
(and an additional demo: Worst-Case Performance Analysis with the DiscoDNC)
Alexander Scheffler, Markus Fögen and **Steffen Bondorf**
In Proc. of the IEEE International Workshop on Computer-Aided Modeling Analysis and Design of Communication Links and Networks (CAMAD '18), September 2018.
- 2018 Catching Corner Cases in Network Calculus – Flow Segregation Can Improve Accuracy
Steffen Bondorf, Paul Nikolaus and Jens B. Schmitt
In Proc. of the 19th International GI/ITG Conference on Measurement, Modelling and Evaluation of Computing Systems (MMB '18), April 2018.
- 2017 Quality and Cost of Deterministic Network Calculus – Design and Evaluation of an Accurate and Fast Analysis
Steffen Bondorf, Paul Nikolaus and Jens B. Schmitt
In Proc. of the ACM SIGMETRICS International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS '17), June 2017. Acceptance rate 13.3%, CORE A*.
- 2017 Better Bounds by Worse Assumptions – Improving Network Calculus Accuracy by Adding Pessimism to the Network Model
Steffen Bondorf
In Proc. of IEEE International Conference on Communications (ICC '17), Communication QoS, Reliability and Modeling Symposium (CQRM), May 2017, CORE B.
- 2017 Generalized Finitary Real-Time Calculus
Kai Lampka, **Steffen Bondorf**, Jens B. Schmitt, Nan Guan and Wang Yi
In Proc. of the 36th IEEE International Conference on Computer Communications (INFOCOM '17), May 2017. Acceptance rate 20.93%, CORE A*.

- 2016 Generalizing Network Calculus Analysis to Derive Performance Guarantees for Multicast Flows
Steffen Bondorf and Fabien Geyer (Airbus Group Innovations)
In Proc. of the 10th EAI International Conference on Performance Evaluation Methodologies and Tools (ValueTools '16), October 2016.
- 2016 Achieving Efficiency Without Sacrificing Model Accuracy: Network Calculus on Compact Domains
Kai Lampka, **Steffen Bondorf** and Jens B. Schmitt
In Proc. of the IEEE International Symposium on Modelling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS '16), September 2016, CORE A.
- 2016 Should Network Calculus Relocate? An Assessment of Current Algebraic and Optimization-based Analyses
Steffen Bondorf and Jens B. Schmitt
In Proc. of the International Conference on Quantitative Evaluation of Systems (QEST '16), August 2016.
- 2016 Improving Cross-traffic Bounds in Feed-Forward Networks – There is a Job for Everyone
Steffen Bondorf and Jens B. Schmitt
In Proc. of the 18th International GI/ITG Conference on Measurement, Modelling and Evaluation of Dependable Computer and Communication Systems (MMB & DFT '16), April 2016.
- 2015 Calculating Accurate End-to-End Delay Bounds – You Better Know Your Cross-Traffic
Steffen Bondorf and Jens B. Schmitt
In Proc. of the 9th EAI International Conference on Performance Evaluation Methodologies and Tools (ValueTools '15), December 2015.
- 2015 Boosting Sensor Network Calculus by Thoroughly Bounding Cross-Traffic
Steffen Bondorf and Jens B. Schmitt
In Proc. of the 34th IEEE International Conference on Computer Communications (INFOCOM '15), April 2015. Acceptance rate 19.3%, CORE A*.
- 2014 The DiscoDNC v2 – A Comprehensive Tool for Deterministic Network Calculus
Steffen Bondorf and Jens B. Schmitt
In Proc. of the 8th EAI International Conference on Performance Evaluation Methodologies and Tools (ValueTools '14), December 2014.
- 2011 Pay Bursts Only Once Holds for (Some) Non-FIFO Systems
Jens B. Schmitt, Nicos Gollan, **Steffen Bondorf** and Ivan Martinovic
In Proc. of the 30th IEEE International Conference on Computer Communications (INFOCOM '11), April 2011. Acceptance rate 16.0%, CORE A*.
- 2010 Statistical Response Time Bounds in Randomly Deployed Wireless Sensor Networks
Steffen Bondorf and Jens B. Schmitt
In Proc. of the 35th IEEE Conference on Local Computer Networks (LCN '10), October 2010. Acceptance rate 30.2%, CORE A.

Journal Articles

- 2017 The Sensor Network Calculus as Key to the Design of Wireless Sensor Networks with Predictable Performance
Jens B. Schmitt, **Steffen Bondorf** and Wint Yi Poe (Huawei)
MDPI Journal of Sensor and Actuator Networks (JSAN), Special issue on QoS in Sensor/Actuator Networks and Systems, September 2017.
- 2017 Quality and Cost of Deterministic Network Calculus – Design and Evaluation of an Accurate and Fast Analysis
Steffen Bondorf, Paul Nikolaus and Jens B. Schmitt
In Proceedings of the ACM on Measurement and Analysis of Computing Systems (POMACS), vol. 1, no. 1, June 2017.
- 2016 Calculating Accurate End-to-End Delay Bounds – You Better Know Your Cross-Traffic
Steffen Bondorf and Jens B. Schmitt
In EAI Endorsed Transactions on Future Internet, vol. 16, no. 11, December 2016.
- 2015 The DiscoDNC v2 – A Comprehensive Tool for Deterministic Network Calculus
Steffen Bondorf and Jens B. Schmitt
In EAI Endorsed Transactions on Internet of Things, vol. 15, no. 4, December 2015.

Parts in Books or Collections

- 2019 Deterministic Network Calculus Analysis of Multicast Flows
Steffen Bondorf and Fabien Geyer
In Antonio Puliafito and Kishor S. Trivedi (Eds.), Systems Modeling: Methodologies and Tools, EAI/Springer Innovations in Communication and Computing. Springer International Publishing, 2019.

Extended Abstracts

- 2018 Demo: Worst-Case Performance Analysis with the Disco Deterministic Network Calculator
Alexander Scheffler, **Steffen Bondorf** and Jens B. Schmitt
In Proc. of the IEEE International Workshop on Computer-Aided Modeling Analysis and Design of Communication Links and Networks (CAMAD '18), September 2018.
- 2017 Towards Unified Tool Support for Real-time Calculus & Deterministic Network Calculus
Philipp Schon and **Steffen Bondorf**
In Proc. of the 29th Euromicro Conference on Real-Time Systems (ECRTS '17), Work-in-Progress Session, June 2017.
- 2015 Network Calculus Tool Support – Expectations and Reality
Steffen Bondorf
In Dagstuhl Reports vol. 5.3, Seminar 15112 – Network Calculus, March 2015.

- 2012 Using Network Calculus to Model Energy Harvesting Wireless Sensor Networks
Steffen Bondorf
In Proc. of the 1st Workshop on Network Calculus, GI/ITG MMB & DFT '12 Workshop Proceedings, March 2012.

Conference Proceedings (Non-Peer-Reviewed)

- 2017 Verification of the FAIR Control System using Deterministic Network Calculus
Malte Schütze, **Steffen Bondorf** and Mathias Kreider
In Proc. of the 16th International Conference on Accelerator and Large Experimental Physics Control Systems (ICALEPCS '17), October 2017.
- 2017 Iterative Design Space Exploration for Networks Requiring Performance Guarantees
Bruno Cattelan and **Steffen Bondorf**
In Proc. of the IEEE/AIAA Digital Avionics Systems Conference (DASC '17), September 2017.

HONORS & ACHIEVEMENTS

- 2017 Awarded Lecturer status (German: Dozent) in the Dept. of Computer Science, TU Kaiserslautern.
- 2016 Best Presentation Award, 3rd Workshop on Network Calculus.
- 2012 PhD program for exceptionally talented students, admittance to PhD doctoral studies.
- 2010 Admittance to the PhD program for exceptionally talented students, PhD graduate studies.
The Department of Computer Science at TU Kaiserslautern maintains a program that promotes exceptionally talented students to start their PhD shortly after finishing undergraduate studies. It is modeled after the US system, i.e., it does not require a Master's degree (equivalent to the German Diplom) before obtaining a PhD degree. I was admitted to this program in spring 2010.
- 2005 Frühstudium.
I am the first student at TU Kaiserslautern who was officially enrolled in an accredited B.Sc. course of studies before finishing secondary education. After an evaluation by my school, Veldenz Gymnasium Lauterecken, as well as a member of the Department of Computer Science, I was allowed to attend regular courses. At the end of my first semester, I also became the first secondary-education student to fulfill the requirements for exam participation. Subsequently, I passed the exam to "Communication Systems", taught by Prof. Jens B. Schmitt.

GRANTS

- 2019 Research Funding, TU Kaiserslautern Young Scientists' Network "Nachwuchsring".
- 2018 Postdoctoral Research Fellowship of the European Research Consortium for Informatics and Mathematics (ERCIM).
- 2016 Junior Researcher Fund, federal state of Rhineland-Palatinate, Germany.
- 2016 Postdoctoral research scholarship, Carl-Zeiss-Foundation.
- 2016 ACM SIGMETRICS / IFIP Performance student travel grant.
- 2012 PhD scholarship, Department of Computer Science, TU Kaiserslautern.
- 2011 IEEE INFOCOM student travel grant.

- 2010 Graduate studies scholarship, Department of Computer Science, TU Kaiserslautern.
 2006 Freshman scholarship, TU Kaiserslautern.

INVITED TALKS

- 2019 Leibniz Center for Informatics, Germany, Dagstuhl Seminar 19101 – Analysis, Design, and Control of Predictable Interconnected Systems, March 2019.
 2017 The DISCO Network Calculator: Modeling and Analysis
 GSI Helmholtz Centre for Heavy Ion Research, Darmstadt, Germany, March 2017.
 2016 Bounding Flow Arrivals in Feed-forward Networks.
 3rd Workshop on Network Calculus, GI/ITG MMB & DFT Workshops, April 2016, elected best presentation by attendees.
 2015 Network Calculus: The Quest for Tight Delay Bounds and the Struggle with Computational Effort.
 Uppsala University, Sweden, Programming for Multicore Architectures Research Center, UpMarc Seminar, October 2015.
 2015 Network Calculus Tool Support – Expectations and Reality.
 Leibniz Center for Informatics, Germany, Dagstuhl Seminar 15112, March 2015.
 2014 Cross-Traffic Arrival Bounds.
 2nd Workshop on Network Calculus, GI/ITG MMB & DFT Workshops, March 2014.
 2013 The DISCO Network Calculator: Design, Capabilities and Future.
 Airbus Group Innovations, Munich, Germany, June 2013.

Departmental Talks

- 2015 Worst-Case Performance Analysis with Network Calculus.
 Department of Computer Science PhD talk series, TU Kaiserslautern, January 2015.

RESEARCH EXPERIENCE

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| 2018 | Performance Analysis of Coflow Systems, fellowship at NTNU Trondheim, Norway, funded by the European Research Consortium for Informatics and Mathematics (ERCIM), duration 1 year. | Postdoctoral
Research Fellow |
| 2016 | Integrated End-to-End Modeling and Analysis of Heterogeneous Distributed Systems with Real-time Constraints
a 2-year project funded by the Carl Zeiss Foundation, project ended in 2018. | Principal
Investigator |
| 2012 | Development, Validation and Tool Support of a Stochastic Calculus for Networks with Flow Transformations, a 3-year project funded by the German Research Foundation (DFG), project ended in 2015. | Researcher |
| 2010 | Ambient Systems, Federal State of Rhineland-Palatinate large-scale project. | Researcher |
| 2008 | Development and Validation of a Calculus for Deterministic and Stochastic Performance Analysis of Wireless Sensor Network, a 3-year project funded by the German Research Foundation (DFG), project ended in 2011. | Researcher,
undergraduate
Research Asst. |

RESEARCH VISITS AND POSTDOCTORAL POSITIONS

- 10/2018 – 09/2019 NTNU Trondheim, Postdoctoral Research Fellow, hosted by Prof. Yuming Jiang.
- 06/2018 – 08/2018 University of Toronto, visiting Research Fellow, hosted by Prof. Jörg Liebeherr.
- 11/2017 – 04/2018 National University of Singapore, Research Fellow, hosted by Prof. Haifeng Yu.
- 09/2016 – 09/2018 TU Kaiserslautern, Principal Investigator of an externally funded research project.
- 11/2015 Uppsala Universitet, visiting Doctoral Researcher, hosted by Prof. Kai Lampka.

PROFESSIONAL SERVICES**Conference and Workshop Organization**

- 2018 The 2018 International Workshop on Network Calculus and Applications (NetCal 2018), TPC member.
- 2018 4th Workshop on Network Calculus (WoNeCa-4), organizing committee member.
- 2012 16th International GI/ITG Conference on “Measurement, Modelling and Evaluation of Computer Systems” and “Dependability and Fault-Tolerance” (MMB & DFT 2012), Kaiserslautern, Germany, local organization co-chair.

Peer-Reviewing

- 2018 IEEE INFOCOM, IFIP Networking, NetCal Workshop, Elsevier Computer Networks, MDPI Sensors
- 2017 IEEE INFOCOM, IEEE RTAS, ITC, ACM Transactions on Wireless Sensor Networks, IEEE Design & Test, EAI ValueTools
- 2016 IEEE INFOCOM, IFIP Networking, NETYS, IEEE MASCOTS, RTNS, IEEE Communications Letters
- 2015 IEEE INFOCOM, IFIP WMNC, EAI ValueTools, Springer JCST
- 2014 IEEE INFOCOM, IEEE RTSS, IFIP Networking, EAI ValueTools, GI/ITG MMB&DFT
- 2013 IEEE RTSS, IEEE ICNP, EAI ValueTools
- 2012 IEEE GLOBECOM, IEEE ICC, IEEE ICCCN, IEEE LCN, IEEE PIMRC
- 2011 IEEE GLOBECOM

Departmental Services

- Search Committee Member Professorship (full professor, W2) for theoretical computer science with an emphasis on algorithmics and complexity, 2016.
- Career Day Representative for the Department of Computer Science, University of Kaiserslautern, at Veldenz Gymnasium Lauterecken (secondary school), April 2016.

TEACHING

The council of the Department of Computer Science at the University of Kaiserslautern officially awarded me the status of a lecturer (German: Dozent) based on a positive evaluation of my teaching.

- 2017 Distributed Computer Systems (tutor, graduate and undergraduate seminar course)
- 2016/2017 Worst-Case Analysis of Distributed Systems
(sole lecturer, 3 credit hours, 4 ECTS credits)
- 2016 Distributed Computer Systems (tutor, graduate and undergraduate seminar course)
- 2015 Worst-Case Analysis of Distributed Systems (substitute lecturer in classes),
Distributed and Networked Systems (tutor, undergraduate seminar course)
- 2014 Performance Evaluation of Distributed Systems (TA, graduate project course),
Software-Defined Networking (tutor, graduate seminar course),
Distributed and Networked Systems (tutor, undergraduate seminar course)
- 2013 Mobile Computing (tutor, graduate seminar course)
- 2012 Distributed and Networked Systems (tutor, undergraduate seminar course)
- 2011 Mobile Computing (tutor, graduate seminar course)
- 2010 Distributed and Networked Systems (tutor, undergraduate seminar course)