



# Dr. Bastian Bloessl

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## Background

- 2019–present **Research Group Leader**, Secure Mobile Networking Lab, TU Darmstadt, Germany.
- 2017–present **General Assembly**, GNU Radio, [www.gnuradio.org](http://www.gnuradio.org).
- 2023–2023 **Substitute Professor (W3)**, Computer Networks, Paderborn University, Germany.
- 2017–2019 **Research Fellow**, CONNECT Center, Trinity College Dublin, Ireland.
- 2017–2018 **Radio Engineer**, Software Radio Systems (SRS).
- 2014–2017 **Researcher**, Distributed Embedded Systems Group, Department of Computer Science and Heinz Nixdorf Institute, Paderborn University, Germany.
- 2015–2016 **Visiting Researcher**, Network Research Lab, Department of Computer Science, University of California, Los Angeles, CA.
- 2011–2014 **Research Assistant**, Computer and Communication Systems (CCS) Group, Institute of Computer Science, University of Innsbruck, Austria.
- 2005–2011 **MSc in Computer Science** (Dipl.-Inform. Univ.) with a minor in physics, University of Würzburg, Germany. Thesis: *Performance Assessment of Resource Allocation Strategies in IEEE 802.16m*.
- 2008–2011 **Student Research Assistant**, Chair of Communication Networks, Department of Computer Science, University of Würzburg, Germany.
- 2005 **Vacation Job**, Bosch GmbH, Bamberg, Germany.
- 2004–2005 **Civilian Service**, SeniVita Seniorenhaus (home for the elderly), Eltmann, Germany.
- 1995–2004 **University-Entrance Diploma** (“Abitur“) Regiomontanus Gymnasium, Haßfurt, Germany, intensive courses: mathematics, physics.

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## PhD Thesis

- Title *A Physical Layer Experimentation Framework for Automotive WLAN*
- Advisor Prof. Dr.-Ing. Falko Dressler
- Reviewer Prof. Dr.-Ing. Matthias Hollick  
Prof. Dr. Renato Lo Cigno
- Graduation June 2018, Dr. rer. nat. (doctor of natural sciences)

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## Research Interests

- Software-Defined Wireless Communication Systems
- Next-Generation Radio Access Networks
- Resilient Wireless Communications

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## Awards and Grants

Ulrich Rohde Award 2022	For outstanding contributions in the field of Software Defined Radio, presented by IARU R1 President Sylvain Azarian and DARC President Christian Entsfellner.
emergenCITY 2021	Collaboration Award 2021 (2nd place)
WiNTECH 2020	Best Paper Award
Uni Paderborn 2019	Nominee for GI (German Informatics Society) Dissertation Award
PhD 2018	Graduation <i>summa cum laude</i> (with distinction)
H2020 2018	Marie Skłodowska-Curie Fellowship
DAAD 2017	FitWeltweit Scholarship
VNC 2013	Best Paper Award
MobiCom 2013	Best Poster/Demo Award of S3 workshop
MobiCom 2013	Travel grant
MobiCom 2012	Runner-up, Student Research Competition
MobiCom 2012	Travel grant
High School 2011	Regiomontanus Award for best final exam in mathematics

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## Research Experience

- 2022–2025 *Open6GHub*: PI of sub-project, working on software-defined Radio Access Networks.
- 2021–2024 *MAKI*: PI of sub-project in collaborative research center MAKI, working on highly adaptive wireless edge networks.
- 2021–2023 *emergenCITY*: Co-Lead of interdisciplinary mission on Aerial Crisis Networks.
- 2017–2019 *PhySim11p*: IEEE 802.11p channel characterization and empirical derivation of physical layer simulation model for network simulators.
- 2012–2018 *BATS*: Tracking of bats in their natural environment using sensor networking technology. The focus was on energy efficient communication of extremely lightweight sensor nodes (2g including battery).
- 2011–2017 *WiME* – Wireless Measurement and Experimentation: SDR-based wireless measurement and experimentation framework for wireless networks, including IEEE 802.11a/g/p and IEEE 802.15.4.
- 2015–2016 *Phy11p*: Evaluation of IEEE 802.11p receive algorithms and their impact on the performance of highly dynamic Vehicular Ad Hoc Networks.
- 2012–2015 Smart Communications for Intelligent Transportation Systems: Communication primitives and protocol design for multi-service applications.

2012–2014 *ENACT* – ENergy-Aware CompuTing: Energy measurement and estimations for off-loading computationally expensive tasks from mobile systems into the cloud.

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## Teaching Experience

[Paderborn University, Germany](#)

Summer 2023 Systems Software and Systems Programming (Lecture, Exercises, and Labs)

[Technical University of Darmstadt, Germany](#)

Winter 2022 Crisis Communication (Lecture, Excursion, Labs, and Exercises)

Winter 2021 Crisis Communication (Lecture, Labs, and Exercises)

Winter 2020 Crisis Communication (Lecture, Labs, and Exercises)

[Online Courses](#)

August 2018 SDR for Pentesters, Attify Inc.

[Paderborn University, Germany](#)

Winter 2016 Cooperative Driving (Project Group)

Winter 2016 Networked Embedded Systems (Exercises)

Winter 2016 Praktikum Mikrocontroller und Interface-Elektronik (Exercises)

Summer 2016 Vehicular Networking (Project Group)

[University of California, Los Angeles](#)

Winter 2015 Advanced Computer Networks (Tutor)

[Paderborn University, Germany](#)

Summer 2015 Vehicular Networking (Project Group)

Winter 2014 Networked Embedded Systems (Exercises)

Winter 2014 Operating Systems (Exercises)

Summer 2014 Network Simulation (Exercises)

[University of Innsbruck, Austria](#)

Summer 2014 Rechnernetze (Exercises)

Winter 2013 Wireless Sensor Networks (Exercises)

Summer 2013 Vehicular Networks (Exercises)

Winter 2012 Network Simulation (Lecture and Exercises)

Winter 2012 Wireless Sensor Networks (Exercises)

Summer 2012 Vehicular Networks (Exercises)

Winter 2011 Network Simulation (Lecture and Exercises)

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## Advised Theses

Master Thesis Michael H., *Feasibility of Digital VHF Communications in Crisis Scenarios*, Advisors: Bastian Bloessl and Matthias Hollick.

Bachelor Thesis Daniel O., *FPGA-Accelerated Wideband Channel Emulator for UAV Networks*, Advisors: Bastian Bloessl and Matthias Hollick.

Master Thesis Niklas M., *Performance Evaluation of Hardware-Accelerated SDR Applications in the Browser*, Advisors: Bastian Bloessl and Matthias Hollick.

- Bachelor Thesis Fabian D., *Spectrum Monitoring with Smart Street Lamps*, Advisors: Bastian Bloessl and Matthias Hollick.
- Bachelor Thesis Philipp S., *Performance Evaluation of Hardware-Accelerated Fast Fourier Transform with GNU Radio*, Advisors: Bastian Bloessl and Matthias Hollick.
- Master Thesis Florian E., *A Full-Band Bluetooth Sniffer for a Software-Defined Radio*, Advisors: Bastian Bloessl, Jiska Classen and Matthias Hollick.
- Bachelor Thesis Robin S., *Performance Analysis of the GNU Radio Runtime Environment*, Advisors: Bastian Bloessl and Matthias Hollick.
- Master Thesis Malte L., *Bluetooth Low Energy Sniffing*, Advisors: Bastian Bloessl, Jiska Classen and Matthias Hollick.
- Bachelor Thesis Fabian M., *MAC Layer Experimentation with Modified WiFi Firmware*, Advisors: Bastian Bloessl, Florian Klingler and Christoph Sommer.
- Bachelor Thesis Carolin R., *Fountain Code based Software Update in Sensor Networks*, Advisors: Bastian Bloessl, Johannes Blobel and Falko Dressler.
- Master Thesis Caius C., *Design and Evaluation of a Lightweight Communication Protocol for Identification and Tracking of Bats in Their Natural Habitat*, Advisors: Bastian Bloessl and Falko Dressler.
- Bachelor Thesis Christoph L., *Integration of the Rime Network Stack into GNU Radio*, Advisors: Bastian Bloessl and Christoph Sommer.
- Bachelor Thesis Fabian M., *Implementierung eines flexiblen Formats zur Beschreibung von Interferenzmessungen*, Advisors: Bastian Bloessl and Christoph Sommer.

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## Tutorials and Guest Lectures

- 2023 *Building Wireless Communication Systems with FutureSDR*, tutorial at NetSys, Hasso-Plattner-Institut, Potsdam, Germany.
- 2021 *Programming Software Defined Radios with GNU Radio*, tutorial at ACM WiSec 2021, virtual.
- 2018 *Wireless Research with SDR*, seminar at INSA Lyon, France.
- 2018 *SDR Meets Wireless LAN*, Deep Dive Session at Wireless LAN Professionals Conference, Phoenix, AZ.
- 2017 *Wireless Research with Software Defined Radio*, guest lecture at Paderborn University, Germany.
- 2017 *GNU Radio Workshop*, SDR Academy, HAMRADIO exhibition, Friedrichshafen, Germany.

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## Talks

- 2023 *Seify: A Rusty SDR Hardware Abstraction Library*, talk at SDR Academy at HAMRADIO, Friedrichshafen, Germany.
- 2022 *FutureSDR: An Async SDR Runtime for Heterogeneous Architectures*, talk at SDR Academy at HAMRADIO, Friedrichshafen, Germany.
- 2021 *A Re-architected GNU Radio Framework for Heterogeneous Systems*, talk at Collaboration for Astronomy Signal Processing and Electronics Research (CASPER) Workshop, Berkeley/Caltech (virtual).

- 2021 *Software Defined Radio Hardware and Software Platforms*, talk at GSI Helmholtz Centre for Heavy Ion Research, Darmstadt, Germany.
- 2021 *A Modular Future for GNU Radio*, talk at SDR DevRoom, FOSDEM, virtual.
- 2020 *Towards GNU Radio 4.0*, organization and lead of breakout session at GRCon 2020, virtual.
- 2020 *Towards GNU Radio 4.0: A Modular Runtime for Heterogeneous Architectures*, talk at GRCon 2020, virtual.
- 2020 *FutureSDR: An Asynchronous SDR Runtime Environment*, talk at Technical University of Berlin, Germany.
- 2020 *GNU Radio on Android*, talk at SDR Academy at HAMRADIO, virtual.
- 2020 *GNU Radio 4.0*, GNU Radio Scheduler Hackfest, virtual.
- 2019 *GNU Radio Meets Scapy*, talk at SDR DevRoom, FOSDEM, Brussels, Belgium.
- 2018 *Software Defined Radio for Security and Privacy Research*, talk at University of Bamberg, Germany.
- 2018 *Using GNU Radio in Research*, talk at CROWNCOM, Ghent, Belgium.
- 2018 *Wireless Research with GNU Radio*, talk at University College Cork, Ireland.
- 2018 *Hacking Vehicular Networks with OpenC2X*, Hackaday Uncon, Dublin, Ireland.
- 2018 *Wireless Research with SDR*, invited talk at GdR ISIS, Paris, France.
- 2017 *Handcrafting Radio Waves*, Probe: Research Uncovered at Trinity College Dublin, Ireland.
- 2017 *Which are the top 3 challenges for free software radio?*, Panel at SDR DevRoom, FOSDEM, Brussels, Belgium.
- 2017 *Receiving Wireless Mobile Traffic Lights*, SDR DevRoom, FOSDEM, Brussels, Belgium.
- 2016 *GQRX as a Graphical Frontend for Digital Receivers*, SDR Academy at HAMRADIO, Friedrichshafen, Germany.
- 2015 *Signals Analytics of Radio Controlled Key Systems*, SDR Academy at HAMRADIO, Friedrichshafen, Germany.
- 2015 *First Steps in Receiving Digital Information with RDS/TMC*, SDR DevRoom, FOSDEM, Brussels, Belgium.
- 2014 *Towards an Open Source IEEE 802.11p Stack*, SDR DevRoom, FOSDEM, Brussels, Belgium.

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## Industry Experience

- 2018 Bughunting and pentesting at German car manufacturer.

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## Governmental Bodies

- 2023 *FutureSDR meets IPEC*, Demo at 6G Platform Germany Meeting of Federal Ministry of Education and Research (BMBF), Berlin, Germany.
- 2019 *Professional Radio*, 2-day training for IT management of the city of Munich, Germany.

- 2018 Connected Autonomous Vehicles (CAV) meeting, Department of Transport, Dublin, Ireland.
- 2017 *IEEE 802.11p Device Fingerprinting*, Talk, Federal Office for Information Security (Bundesamt für Sicherheit in der Informationstechnik), Bonn, Germany.

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## Open Source Involvement

- FutureSDR I initiated and maintain FutureSDR, a fresh take on an SDR runtime with many unique and novel features (<https://www.futuresdr.org/>).
- GNU Radio I contribute to GNU Radio and am one of the Project Officers.
- Misc I initiated and maintain several Open Source projects. They can be found on GitHub (<https://github.com/bastibl/>).
- GSoC 2017 I was a mentor for Google Summer of Code 2017.

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## Academic Services and Memberships

- Co-Organizer MAKI Scientific Workshop 2023 on Next Generation Wireless Edge Networks
- TPC Chair CROWNCOM 2019 Workshop on Open Radio Platforms for 5G Research and Beyond
- Demo Chair IEEE SECON 2023
- Publication Chair IEEE VNC 2016
- Publicity Chair IEEE WoWMoM 2020
- Web Chair ACM MobiHoc 2016
- Session Chair IEEE WCNC 2023, Wireless Days 2019
- Area Editor Elsevier Computer Communications
- TPC Member IEEE VNC 2024, ACM WiNTECH 2023, VTC2023-Fall, IEEE VNC 2023, ICCCN 2023, VTC2022-Fall, ACM WiNTECH 2022, VTC2022-Spring, ANT 2022, NetSys 2021 (Early Work Track), IEEE VNC 2021 (conference and poster/demo session), Wireless Days 2021, IEEE ISC2 2021, ACM WiNTECH 2021, ANT 2021, IEEE VNC 2020, IEEE/IFIP WONS 2021, VTC2021-Spring, IEEE WCNEE 2020, ANT 2020, IEEE VNC 2019, VEHITS 2020, VTC2020-Spring, IOV 2019, IEEE SECON 2019, IEEE MASS 2019, IEEE WCNEE 2019, VTC2019-Spring, VEHITS 2019, Wireless Days 2019, IEEE VNC 2018, VTC2018-Fall, IEEE GreenCom 2018, ITC 30, IEEE VNC 2015
- Volunteer IEEE VNC 2014, ACM MobiHoc 2016

Reviewer **Journals:** ACM Transactions on Autonomous and Adaptive Systems, Elsevier Ad Hoc Networks, Elsevier Computer Communications, Elsevier Computer Networks, Elsevier Future Generation Computer Systems, Elsevier Transportation Research Part C, Elsevier Vehicular Communications, EURASIP Journal on Wireless Communications and Networking, IEEE Communications Letters, IEEE Embedded Systems Letters, IEEE Internet of Things Journal, IEEE Open Journal of the Communications Society, IEEE Systems Journal, IEEE Transactions on Communications, IEEE Transactions on Industrial Informatics, IEEE Transactions on Intelligent Vehicles, IEEE Transactions on Mobile Computing, IEEE/ACM Transactions on Networking, IEEE Transactions on Vehicular Technology, IEEE Transactions on Wireless Communications, IEEE Wireless Communications Letters, Springer Mobile Networks and Applications, Springer Wireless Networks, Wiley International Journal of Communication Systems, **Conferences:** ACM MSWiM'13, ACM MSWiM'15, ACM Q2Winet'13, ACM WUWNet'13, CyberC'15, ICCVE'13, IEEE CCNC'16, IEEE ICC'13, IEEE ICC'14, IEEE ICC'15, IEEE INFOCOM'13, IEEE INFOCOM'18, IEEE LCN'12, IEEE LCN'14, IEEE VNC'15, IEEE VNC'17, IEEE WCNC'14, IEEE WCNC'16, IEEE WCNC'19, ISCAS'17, OMNeT++ Workshop'12, WONS'16, WONS'17

Membership ACM (SIGMOBILE), IEEE (ComSoc), GI (KuVS)

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## Non-Academic Projects

- 2018 *Instant GNU Radio* provides a VM and live environment for lectures and workshops on SDR. <https://github.com/bastibl/instant-gnuradio/>
- 2017 With *WiFi Soundscapes*, I made the WiFi spectrum visible and audible. <https://www.bastibl.net/star-fi/>
- 2015 Reverse engineering signals from mobile traffic lights. <https://www.bastibl.net/traffic-lights/>
- 2015 Reverse engineering telemetry signals from public transportation. <https://www.bastibl.net/reversing-bus-telemetry/>
- 2014 Reverse engineering signals from a wireless car key fob. <https://www.bastibl.net/gr-keyfob/>
- 2014 Reverse engineering signals from a weather balloon. <https://github.com/bastibl/gr-rstt/>

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## Languages

German native  
English fluent

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## Professional Training (received)

- 2021 Science Communication, Dr. André Lampe
- 2021 Successful Interdisciplinary Collaboration, Dr. Simone Brandstädter
- 2018 Communications and Public Engagement, Simon Raybould (Aware Plus)
- 2017 H2020 Pathways to Funding
- 2017 Leading Effective Meetings

- 2017 Career Development Program for Postdoctoral Researchers
- 2017 *Why don't people listen when I talk about my work?*, storytelling with Steve Rawlings

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## Hobbies and Interests

- Sports mountain biking, running
- Music acoustic and electric guitar, generative music, audio recording
- Amateur Radio CEPT 1-licensed (call sign: DF1BBL)
- World View emacs > vim

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## Selected Publications

- David Volz, Andreas Koch and **Bastian Bloessl**, “*Software-Defined Wireless Communication Systems for Heterogeneous Architectures*,” Proceedings of 29th Annual International Conference on Mobile Computing and Networking (MobiCom 2023), Demo Session, Madrid, Spain, October 2023.
- Lars Baumgärtner, Maximilian Bauer and **Bastian Bloessl**, “*SUN: A Simulated UAV Network Testbed with Hardware-in-the-Loop SDR Support*,” Proceedings of IEEE Wireless Communications and Networking Conference (WCNC 2023), Glasgow, Scotland, March 2023.
- **Bastian Bloessl**, Lars Baumgärtner and Matthias Hollick, “*Hardware-Accelerated Real-Time Stream Data Processing on Android with GNU Radio*,” Proceedings of 14th International Workshop on Wireless Network Testbeds, Experimental evaluation and Characterization (WiNTECH'20), London, UK, September 2020.
- **Bastian Bloessl**, Marcus Müller and Matthias Hollick, “*Benchmarking and Profiling the GNU Radio Scheduler*,” Proceedings of 9th GNU Radio Conference (GRCon 2019), Huntsville, AL, September 2019.
- **Bastian Bloessl** and Aisling O’Driscoll, “*A Case for Good Defaults: Pitfalls in VANET Physical Layer Simulations*,” Proceedings of IFIP Wireless Days Conference 2019, Manchester, UK, April 2019.
- **Bastian Bloessl** and Falko Dressler, “*mSync: Physical Layer Frame Synchronization Without Preamble Symbols*,” IEEE Transactions on Mobile Computing, 2018, DOI 10.1109/TMC.2018.2808968.
- **Bastian Bloessl**, Michele Segata, Christoph Sommer and Falko Dressler, “Performance Assessment of IEEE 802.11p with an Open Source SDR-based Prototype,” IEEE Transactions on Mobile Computing, 2018, DOI 10.1109/TMC.2017.2751474.
- **Bastian Bloessl**, Christoph Sommer, Falko Dressler and David Eckhoff, “*The Scrambler Attack: A Robust Physical Layer Attack on Location Privacy in Vehicular Networks*,” Proceedings of 4th IEEE International Conference on Computing, Networking and Communications (ICNC 2015), CNC Workshop, Anaheim, CA, February 2015.
- **Bastian Bloessl**, Christoph Leitner, Falko Dressler and Christoph Sommer, “*A GNU Radio-based IEEE 802.15.4 Testbed*,” Proceedings of 12. GI/ITG KuVS Fachgespräch Drahtlose Sensornetze (FGSN 2013), Cottbus, Germany, September 2013, pp. 37-40.

A list of all publications is available at <http://www.bastibl.net/publications/>.