Niklas Medinger

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Education

Current - 05/2022 **Ph.D. Student**, *CISPA - Helmholtz Center for Information Security*, Saarbrücken.

04/2022 - 10/2020 **Graduate School**, *Saarland University*, Saarbrücken.

09/2020 - 10/2017 **B.Sc. Cybersecurity**, *Saarland University*, Saarbrücken.
Grade: 1.3

Employment

08/2023 - 11/2023 **Applied Science Intern**, *Amazon Web Services Inc.*, Santa Clara.
I was an intern at AWS in the automated reasoning group under the supervision of Dimitra Giannakopoulou and Zvonimir Rakamaric in Santa Clara, California.

Current - 05/2022 **Ph.D. Student**, *CISPA - Helmholtz Center for Information Security*, Saarbrücken.
I started my PhD under the supervision of Cas Cremers. My research topics include increasing the expressiveness and automation of current state-of-the-art verification techniques as well as the modeling and verification of cryptographic protocols with the Tamarin Prover.

09/2020 - 04/2019 **Research Assistant**, *CISPA - Helmholtz Center for Information Security*, Saarbrücken.
In the research group of Cas Cremers, I created a formal model of the WPA2 Wi-Fi protocol together with Benjamin Kiesl-Reiter and used the Tamarin prover to verify it. This work resulted in a research paper we published at USENIX Security 2020.

04/2019 - 05/2018 **Research Assistant**, *CISPA - Helmholtz Center for Information Security*, Saarbrücken.
I worked in the research group of Michael Backes under Ph.D. student David Pfaff. Topics I worked on include attacks on machine learning models using adversarial patches and bug detection based on similarities in the abstract syntax tree of code.

Publications

11/2024 **Impossibility Results for Post-Compromise Security in Real-World Communication Systems**, *Cas Cremers, Niklas Medinger, and Aurora Naska*, Under submission.

10/2024 **Keeping Up with the KEMs: Stronger Security Notions for KEMs and automated analysis of KEM-based protocols**, *Cas Cremers, Alexander Dax, and Niklas Medinger*, Appeared in: Proceedings of the 2024 on ACM SIGSAC Conference on Computer and Communications Security (CCS 24).

08/2020 **A Formal Analysis of IEEE 802.11's WPA2: Countering the Kracks Caused by Cracking the Counters**, *Cas Cremers, Benjamin Kiesl, and Niklas Medinger*, Appeared in: Proceedings of the 29th USENIX Security Symposium (USENIX 2020).

Teaching Experience

04/2025 - 10/2024 **Teaching Assistant**, *Saarland University*, Saarbrücken.
I was a teaching assistant for the second iteration of the *Formal Analysis of Real-World Security Protocols* lecture.

10/2022 - 04/2022 **Teaching Assistant**, *Saarland University*, Saarbrücken.
I was a teaching assistant for the first iteration of the *Formal Analysis of Real-World Security Protocols* lecture. My tasks included developing the curriculum, as well as designing and grading exercise sheets, student projects, and exams.

10/2019 - 09/2019 **Lecturer**, *Saarland University*, Saarbrücken.
Once more, I voluntarily helped organize the math pre-course of Saarland University. Additionally, I gave one week of lectures to students on the topic of formal proof techniques.

10/2019 - 04/2019 **Programming Tutor**, *Saarland University*, Saarbrücken.
I was a tutor for the lecture *Programming II* given by Prof. Dr. Jörg Hoffmann. In the lecture, the students learn the basics of imperative and object-oriented programming.

05/2019 - 04/2019 **Programming Tutor**, *Saarland University*, Saarbrücken.
I voluntarily helped creating the first programming pre-course for the lecture *Programming II*. This included creating a curriculum, designing and coding a project for the students, and tutoring the students.

04/2019 - 10/2018 **Cybersecurity Tutor**, *CISPA - Helmholtz Center for Information Security*, Saarbrücken.
I was a tutor for the lecture *Foundations of Cybersecurity I* given by Dr.-Ing. Ben Stock. The lecture serves as an introduction to cryptography, software security, and web security.

10/2018 - 09/2018 **Math Tutor**, *Saarland University*, Saarbrücken.
During the semester break, I voluntarily helped organize the math pre-course of Saarland University and tutored its students. The course introduces new computer science students to formal logic.