Oliver Braunsdorf

☎ +49 15782559000 | ✉ oliver.braunsdorf@posteo.de
🌐 https://obraunsdorf.dev | in https://www.linkedin.com/in/obraunsdorf

SUMMARY

Self-driven software engineer and IT security researcher with a team-first attitude. Main field of interest is software security, including static and dynamic program analysis, program hardening, and secure software design—especially with the Rust programming language. Passionate learner, communicative problem solver, open-source software creator, and American Football player and coach.

PROFESSIONAL EXPERIENCE

Fraunhofer Institute for Applied and Integrated Security (AISEC)   Munich, Germany
Software Engineer & Security Researcher, Dept. Secure Operating Systems   Jan 2018 – Present
- Consulted Fortune 500 companies and federal agencies regarding the design of secure system architectures, and assisted in software development and source code audits.
- Developed static and dynamic analysis tools based on LLVM and the Rust compiler for detecting and preventing software vulnerabilities, balancing security and performance.
- Managed research and software engineering projects with teams of 2-4 people, and provided guidance for junior colleagues and students to help reach their goals.

Secunet Security Networks AG   Dresden, Germany
Internship, Research & Development   Apr 2016 – Sept 2016
- Implemented optimization strategies inside the Linux Kernel's IPsec subsystem to maximize the throughput of encrypted connections in gigabit ethernet networks.

Dotsource GmbH   Jena, Germany
Internship, Software Engineer Quality Assurance   Nov 2010 – June 2011
- Increased testing efficiency by developing an infrastructure for automated browser-based UI tests for websites, which reduced the need for manual testing.

EDUCATION

Technical University of Munich   Munich, Germany
Ph.D. Candidate in Computer Science   Jan 2019 – Present
- Research directions: compiler-based software security, memory safety, control-flow integrity, static analysis, programming languages

Technical University of Ilmenau   Ilmenau, Germany
M.Sc. in Computer Science, final grade: 1.2 (GPA: 3.8)   Apr 2015 – Oct 2017
- Honors: Degree with distinction
- Specializations: IT-Security, Computer Networks, Programming Languages
- Thesis topic: Static Verification of Secure Software Design Patterns

Technical University of Ilmenau   Ilmenau, Germany
B.Sc. in Computer Science, final grade: 1.7 (GPA: 3.3)   Oct 2011 – Mar 2015
- Specializations: IT-Security, Database Systems, Distributed Systems
- Thesis topic: Incremental algorithms for analyzing network monitoring data
- Relevant seminars: Implementation and simulation of Internet protocols (TCP/IP, Routing Protocols, Omnet++), Security of Interdomain Routing Protocols (BGP)

SELECTED PROJECTS

Model-Checked Network Protocol (Async Rust / TLA+)

Designed and implemented a network protocol to establish communication channels based on mutual remote attestation. Used the TLA+ model checker to model the protocol's state machine and prove security and liveness properties. Refactored implementation to utilize asynchronous Rust code for performance, taking architectural inspiration from Cloudflare's QUIC implementation *Quiche*.
https://github.com/International-Data-Spaces-Association/idscp2-rust

Memory-Safety for Mixed-Language Binaries (Rust / C++)

Developed a concept to increase the performance of memory-safety sanitizers for mixed-language programs (consisting of Rust and C/C++ code) by optimizing away unnecessary sanitizer checks for memory objects whose safety can be proven by Rust's type system. Implemented the PoC by modifying the Rust compiler and two LLVM memory-safety sanitizers.
https://obraunsdorf.dev/talks/safeffi

SKILLS & CERTIFICATIONS

Languages:	German (native), English (fluent), Spanish (beginner)
Programming Languages:	Rust, C, C++, Python (used daily for work and research)
Compiler Development:	LLVM Framework, Rust Compiler
Debugging & Profiling:	GDB, Valgrind, Linux perf, Hyperfine
Build Tools & Processes:	GitHub Actions, Gitlab CI, Docker, CMake, Cargo
Certifications:	Professional Scrum Master I, Scrum.org

PUBLISHED RESEARCH PAPERS & TALKS

Braunsdorf, O., Sessinghaus, S., & Horsch, J. (2022). Resilient CFI: Compiler-based Attack Origin Tracking with Dynamic Taint Analysis. In International Conference on Information Security and Cryptology (pp. 175-191). Springer, Cham.

Ensuring Memory Safety for the Transition from C/C++ to Rust. (2023). *Rust Munich Meetup*.

INTERESTS

Serving as the defensive captain on the German National Team for American Flag Football, leading the team through wins, losses, and rebuilds over multiple European and World championships.

Coaching American Football and playing various team and individual sports, e.g., Soccer, Volleyball, and Pickleball.

Maintaining an open-source GUI application for creating American Football playbooks, communicating with users across Europe to improve its features: https://playbook-creator.obraunsdorf.dev