Oliver Braunsdorf

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SUMMARY

Self-driven security researcher and software engineer with a team-first attitude. Main field of interest is software security, including static and dynamic program analysis, compiler-based software 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.

EMPLOYMENT

LMU University of Munich   Munich, Germany
Research Assistant, Chair for Programming Languages and AI   Jan 2024 – Present
- Developed static and dynamic analysis tools based on the Rust compiler and LLVM for improving security and performance in Rust and C/C++.

Fraunhofer Institute for Applied and Integrated Security (AISEC)   Munich, Germany
Research Software Engineer, Dept. Secure Operating Systems   Jan 2018 – Sept 2023
- Consulted Fortune 500 companies and federal agencies regarding the design of secure system architectures and assisted in software development and source code audits.
- 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 & LMU 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
- Advisor: Prof. Johannes Kinder

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 in C++

Technical University of Ilmenau   Ilmenau, Germany
B.Sc. in Computer Science, final grade: 1.7 (GPA: 3.3)   Oct 2011 – Mar 2015

SELECTED PROJECTS

Memory-Safety for Mixed-Language Binaries (Rust / C++)
Created and implemented a concept to increase the performance of memory-safety sanitizers for mixed-language applications by optimizing away unnecessary sanitizer checks for memory objects whose safety can be proven by Rust's type system. https://obraunsdorf.dev/talks/safeffi

Codyze (Java)
Collaborated in a team of computer scientists and cryptographers to develop a static analysis framework based on code property graphs for verifying the correct usage of APIs of cryptographic libraries in security-critical applications. https://www.codyze.io

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 properties. https://github.com/International-Data-Spaces-Association/idscp2-rust

SKILLS & CERTIFICATIONS

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

PUBLISHED RESEARCH PAPERS & TALKS

Braunsdorf, O., Hohentanner, K., & Kinder, J. (2024). Ensuring Memory Safety for the Transition from C/C++ to Rust. Poster at the Network and Distributed System Security (NDSS) Symposium.

Orthen, B., Braunsdorf, O., Zieris, P., & Horsch, J. (2024). SoftBound+CETS Revisited: More Than a Decade Later. In Proceedings of the 17th European Workshop on Systems Security.

Invited Talk at Galois.Inc (2023): Ensuring Memory Safety for the Transition from C/C++ to Rust.

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. Springer, Cham.

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.

Maintaining open-source software for American Football: https://playbook-creator.obraunsdorf.dev