Robert Clausecker

curriculum vitæ

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Employment

2023–2026 **stipend**, *NHR-Verein e. V.*, hosted by Zuse Institute Berlin (ZIB)
Pursuing a doctoral degree (Dr. rer. nat.) in scientific computing under Prof. Dr. Ch. Schütte. Title: Combinatorial SIMD Programming.

2020–2023 **research assistant**, *Zuse Institute Berlin (ZIB)*
Heuristic search, member of the scalable algorithms workgroup under Dr. F. Schintke

2017–2020 **student assistant**, *Zuse Institute Berlin (ZIB)*
Heuristic search, student member of the scalable algorithms workgroup under Prof. Dr. A. Reinefeld and Dr. F. Schintke

2013–2017 **student assistant**, *Fraunhofer Institute FOKUS*, Berlin
Formal verification, assistant to Dr.-Ing. J. Gerlach

summer 2013 **intern**, *Fraunhofer Institute FOKUS*, Berlin
Work on Solaris distribution “Schillix” under Dipl.-Inf. J. Schilling

summer 2012 **intern**, *Meteo-Service Weather Research GmbH*, Berlin
Evaluation of GPU accelerators for numerical weather prediction

summer 2011 **intern**, *Zuse Institute Berlin (ZIB)*

Freelance Work

2023 **research project**, *The FreeBSD Foundation*
Development of SIMD-enhanced libc string functions

summer 2022 **research fellow**, *Université du Québec (TÉLUQ)*, Montréal
fall 2023 Combinatorial SIMD programming, research under Prof. D. Lemire

Teaching

summer 2024 **lecture**, *Parallel systems*, Hochschule für Technik und Wirtschaft Berlin, Lehrbeauftragter

spring 2024 **block seminar**, *Object oriented programming: introduction to C programming*, Free University of Berlin, Lehrbeauftragter

spring 2018 – summer 2018 – spring 2019 **block seminar**, *ProInformatik VII: introduction to C programming*, Free University of Berlin, TA to Prof. Dr. M. Esponda-Argüero

spring 2019 **seminar**, *pattern databases for heuristic search methods*, Humboldt University of Berlin, TA to Prof. Dr. A. Reinefeld

Languages

native **German**

English, *Herder Gymnasium*, Berlin

Chinese, *Herder Gymnasium*, Berlin

Education

2023– **doctoral studies**, *Free University*, Berlin, scientific computing
Completion expected for 2026. Research at Zuse Institute Berlin.

2020 **Master of Science**, *Humboldt University*, Berlin, informatics

2017 **Bachelor of Science**, *Humboldt University*, Berlin, informatics

2013 **Abitur**, *Herder Gymnasium*, Berlin

2011 **Student Exchange**, *Dayuan International Senior Highschool*, Taoyuan, Taiwan, 6 months

2011 **Mittlerer Schulabschluss**, *Herder Gymnasium*, Berlin

Experience

- artificial intelligence specialist (heuristic search, planning)
- pattern database and endgame tablebase programming
- high performance programming and SIMD optimization
- parallel and distributed computing
- algorithms engineering
- compiler and interpreter programming
- UNIX systems programming (with focus on portability)
- formal verification
- software standardisation
- relational databases
- expert assembly programmer (x86, ARM, ARM64, ...)
- expert C programmer (K&R C, ANSI C, C99, C11, C23)
- Forth, Go, Haskell, J, POSIX shell, bash, ...
- High quality typesetting with TEX and LATEX
- FreeBSD systems administration

Awards

2021 SoCS 2021 — Best Paper Award (with Dr. F. Schintke)

2021 SAT Competition 2021 — Special Innovation Price (with B. Kaiser)

Selected Publications

2023 Transcoding Unicode Characters with AVX-512 Instructions, Software: Practice and Experience, Wiley, 2023

2023 Prioritised Unit Propagation by Partitioning the Watch Lists, Pragmatics of SAT 2023

2021 A Measure of Quality for IDA* Heuristics, SoCS 2021 Proceedings, p. 55–63 (best paper award)

2020 The Quality of Heuristic Functions for IDA*, ZIB Report 20-17

2019 Zero-Aware Pattern Databases with 1-Bit Compression for Sliding Tile Puzzles, SoCS 2019 Proceedings, p. 35–43

2017 Notes on the Construction of Pattern Databases, ZIB Report 17-59

Selected Projects

- various Go bindings for the NFC stack
  https://github.com/clausecker/{nfc,freefare,openkey}
- dobutsu – tablebase and engine for Dōbutsu Shōgi
  https://github.com/clausecker/dobutsu
- 24puzzle – 24 puzzle solver
  https://github.com/clausecker/24puzzle
- 8bc – B compiler for the PDP-8
  https://github.com/clausecker/8bc
- Palanqin – ARM Cortex M0 emulator for DOS
  https://github.com/clausecker/palanqin
- pospop – SIMD-optimized positional population count routines
  https://github.com/clausecker/pospop
- Mecrisp Stellaris – Forth system, contributed a FreeBSD port
  http://mecrisp.sourceforge.net/
- schilytools – Jörg Schilling's libraries and utilities (maintainer)
  https://codeberg.org/schilytools/schilytools
- simdutf – SIMD-accelerated UTF routines
  https://github.com/simdutf/simdutf (contributed AVX-512)

Personal Interests

- FreeBSD ports committer and project member
- chairman of the Berlin Linux User Group (https://belug.de)

- avid Stack Overflow contributor
  https://stackoverflow.com/users/417501
- vintage computing enthusiast and founding member of Vintage Computing Festival Berlin e. V. (https://vcfb.de)
- size coding and competitive programming
- software development for vintage computers
- calligraphy (Latin, Chinese)