Philipp **Jung**

Software Engineer · Research & Development

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"C++ and Rust enthusiast with 5+ years of professional and academic experience developing performance-critical C++ applications following DevOps and agile principles. Passionate about developer experience and looking to grow as an engineer and architect."

Experience

Senior Software Engineer "HANA Database Kernel: Storage Engine"
Walldorf, DE

SAP SE — *01/2023 – Present*

- Reduced compile times by 10%. Developed continuous monitoring to improve developer experience and reduce costs
- Part of an internal group to manage department-wide quality standards
- Maintainer of CodeExplorer, a web application to interactively browse source code with compiler generated cross links and statistics
- **Technologies:** *C++17/20/23, Rust, Python, Google Test/Benchmark Framework, CMake, Docker*

Software Engineer "HANA Database Kernel: Storage Engine"
Walldorf, DE

SAP SE — *01/2021 – 12/2022*

- Optimized data structures for performance at scale (for very large table partitions of ~2 billion rows)
- Drove large refactoring efforts reducing code complexity and increase development velocity
- **Technologies:** *C++17/20, Python, Google Test/Benchmark Framework, CMake, Docker*

Software Engineer "R&D: Simulation on Computed Tomography Data"
Heidelberg, DE

Volume Graphics GmbH — *04/2019 – 12/2020*

- Drove a system-wide architectural change improving startup times of a multi-million LOC cross-platform C++ application by 30%
- Achieved 90% reduction in CI feedback times by a paradigm shift toward a pull-request workflow with automated CI/CD pipeline
- **Technologies:** *C++14/17, Python, Google Test Framework, CMake, QT, Conan, Docker, Jenkins, Scrum*

Maintainer of libPRTL "C++ library for Scalar/Vector and Tensor field processing"
Heidelberg University, DE

Institute of Computer Science — *04/2017 – 05/2019*

- Provided reference implementations of widely used performance-critical algorithms in the field of scientific visualization
- Added rapid prototyping capabilities using python bindings (pybind11) for C++, significantly reducing development lead times
- **Technologies:** *C++14/17, Python (pybind11), Eigen, Boost, Catch2/Doctest, CMake, CUDA, OpenMP, VTK, Gitlab CI, Docker*

Research-Integrated Master
Heidelberg University, DE

Institute of Computer Science — *04/2017 – 03/2019*

- Research project: "Feature Extraction from Time-Dependent and Uncertain Vector Fields"
- Developed and implemented high-performance visualization algorithms for chaotic dynamical systems
- **Technologies:** *C++14/17, Python, Eigen, CMake, CUDA, OpenMP, VTK*

Student Research Assistant
Heidelberg University, DE

Institute of Computer Science — *10/2016 – 09/2017*

- Designed and developed visualization tools for tropical cyclones with the ParaView/VTK framework using modern C++
- **Technologies:** *C++11/14, Eigen, CMake, VTK*

Education

Heidelberg University
Heidelberg, DE

M.Sc. in Applied Computer Science, Minor in Mathematics · **German GPA: 1.0 with distinction** — *04/2017 – 03/2019*

- Thesis: "On the Frame of Reference in Flow Visualization", *grade: 1.0 (A+)*
- **Technologies:** *C++14/17, Eigen, Catch2/Doctest, CMake, Python, Matlab, Docker, VTK*

Heidelberg University
Heidelberg, DE

B.Sc. in Applied Computer Science, Minor in Economics · **German GPA: 1.5** — *10/2013 – 03/2017*

- Thesis: 'Interpolation-Consistent Visualization of Bifurcations 2D Time-Dependent Vector Fields", *grade: 1.0 (A+)*
- **Technologies:** *C++11, Eigen, Catch2/Doctest, CMake, VTK*

Skills

Programming Languages

- C++11/14/17/20/23 — Advanced
  - Google Test Framework — Advanced
  - (Modern) CMake — Advanced
  - Catch2/Doctest — Intermediate
  - Google Benchmark — Basic
- Rust — Intermediate
- Python — Intermediate
- SQL — Basic
- JavaScript — Basic

Tools & Frameworks

- Git — Advanced
- Gerrit — Advanced
- Linux (Arch/Debian) — Advanced
- Docker — Advanced
- LaTeX — Advanced
- Agile(Scrum) — Intermediate
- CI/CD(Jenkins/Github) — Intermediate
- CUDA — Basic
- Kubernetes — Basic

Languages

- English — (TOEFL iBT 115/120) Fluent
- German — Native

Soft Skills

Responsibility **Critical Thinking** **Problem-Solving** **Leadership** **Teamwork** **Effective Communication**

Personal Projects

Compile Time Explorer

Automated web-based visualization tool to track compilation times of (large) C++ projects — *05/2023 – Present*

- Build on-top of clangs *-ftime-trace* profile and ClangBuildAnalyzer
- Allows interactive exploration of compile times by translation units, headers, functions and templates
- **Technologies:** *Rust, JavaScript, Docker, NGINX*

Easy-Utility-Cost

Web-based utility cost calculation tool for apartment buildings and landlords — *02/2019 – Present*

- Designed asynchronous business logic in Rust compiled to WebAssembly
- Developed a fast client-side page rendering based on JavaScript
- **Technologies:** *Rust, WebAssembly, JavaScript, Docker, NGINX*

Publications

DNA Accessibility of Chromatosomes Quantified by Automated Image Analysis

Nature: Scientific Reports

M. Würtz, D. Aumiller, L. Gundelwein, **P. Jung** et al. — *09/2019*

- Interdisciplinary research project with the German Cancer Research Center (DKFZ)
- Designed an automated Matlab pipeline and implemented image denoising preprocessing steps using OpenCV
- **Technologies:** *Matlab, C++, OpenCV, LaTeX, Git*

Tumble-Vortex Core Line Extraction

SIBGRAPI WVIS, 2017

P. Jung, P. Hausner, L. Pilz, J. Stern, C. Euler, M. Riemer, and F. Sadlo — *10/2017*

- Conceived and implemented a new algorithm in C++ to detect vortex core lines in previously unsolved cases
- Visualized analytical and simulated datasets using custom C++ plugins for ParaView/VTK
- **Technologies:** *C++14/17, Eigen, Catch2/Doctest, CMake, ParaView, VTK*

Honors & Awards

2017 – 2018 **Research Scholarship**, sponsored by HGS MathComp and DFG

2017 **Award for Exceptional Students**, sponsored by Beer Foundation

2015 – 2016 **Germany Scholarship**, sponsored by Leonie Wild Foundation

Volunteer Activity

Working Committee for Education

Student Representation

Student Representative — *10/2016 – 03/2019*

- Organized weekly meetings coordinating university-wide student representation

Senate Committee for Education

Heidelberg University, DE

Student Representative — *12/2016 – 09/2018*

- Negotiated flexible university-wide attendance rules in lectures
- Represented student interest's concerning university-wide changes in study guidelines

Child Care Project e.V., Humanitarian Organization

Heidelberg, DE

Member — *06/2014 – 02/2016*

- Successfully organized multiple fundraising events to finance a new primary school building in Uganda
- Designed and maintained website based on Hugo