

# 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 of a multi-million lines-of-code product by 10% and developed continuous monitoring to improve developer experience
- Member 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 Chromosomes 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 WWIS, 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