

Viktor Klochkov, Ph.D.

Software Engineer | C++ Systems

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PROFESSIONAL SUMMARY

Software Engineer with 10+ years of C++ expertise delivering high-performance, safety-critical software for medical devices (Brainlab Cranial Navigation R&D) and large-scale scientific computing. Deep hands-on experience in custom static analysis tooling (Clang-tidy), GPU/CPU acceleration (CUDA, OpenCL, SIMD), TDD, and architecting robust C++ frameworks. Ph.D. in Nuclear Physics. Combines rigorous scientific background with production software engineering discipline.

TECHNICAL SKILLS

Programming Languages	C++ (C++11–C++20), Python, CUDA
Python Ecosystem	NumPy, Pandas, SciPy, Matplotlib
Static Analysis	Clang-tidy (custom checks), GDB, Valgrind
Build & DevOps	CMake, Docker, Git, GitLab/GitHub, CI/CD
Development Practices	Test-Driven Development, BDD, Agile/Scrum, Code Review
ML & Data Science	Machine Learning, AI pipelines, scikit-learn
AI-assisted development	Claude Code agent-driven development, Github Copilot (agents, CLI)

PROFESSIONAL EXPERIENCE

Advanced Software Engineer 05/2022 – Present
Brainlab · Munich, Germany Full-stack C++ application engineer, Cranial Navigation R&D (medical device software)

- Engineered life-critical C++ application components for Cranial Navigation surgical guidance software used in **thousands of surgeries annually across 100+ countries**
- Designed and introduced a company-wide Clang-tidy ruleset with **5+ custom checks** authored from scratch, eliminating entire classes of bugs (including pointer comparison defects) at compile time across the entire C++ codebase
- Maintained **>90% unit test coverage** across all new modules by championing Test-Driven Development, ensuring reliability in safety-critical medical device software (IEC 62304)
- Delivered production releases in Agile/Scrum environment, contributing to the full software lifecycle from architecture through QA and regulated release

PostDoc Researcher 2020 – 2022
Eberhard Karls University of Tübingen · Tübingen, Germany C++/Python frameworks for physics data analysis, Machine Learning, and AI

- Architected modular, high-performance C++/Python data analysis frameworks adopted by multiple large international physics collaborations (**CBM, HADES, ALICE**)
- Built machine learning pipelines (Pandas, SciPy, NumPy) for particle selection, delivering measurably superior classification performance compared to traditional rule-based selection criteria
- Reduced experiment analysis setup time through reusable library design, thorough documentation, and cross-collaboration knowledge transfer

PostDoc Researcher

2020

Facility for Antiproton and Ion Research (FAIR) · Darmstadt, Germany *C++ software development for high-energy physics experiments*

- Developed optimized C++ data analysis frameworks for processing detector data from high-energy physics experiments

Scientist & Ph.D. Researcher

2015 – 2019

GSI Helmholtzzentrum für Schwerionenforschung · Darmstadt, Germany *C++ software for nuclear physics data analysis*

- Built production-grade C++ analysis frameworks for heavy-ion collision detector data, enabling key physics publications
- Completed Ph.D. in Nuclear Physics, graduating **magna cum laude**

EDUCATION

Ph.D., Nuclear Physics

2015–2019

Johann Wolfgang Goethe University, Frankfurt, Germany *Graduated magna cum laude*

M.Sc., High Energy Physics

2013–2015

Taras Shevchenko National University, Kyiv, Ukraine *Graduated with distinction*

B.Sc., Physics

2009–2013

Taras Shevchenko National University, Kyiv, Ukraine *Graduated with distinction*

PROFESSIONAL DEVELOPMENT

Test-Driven Development · Coding Academy

July 2025

4-week intensive course

Functional Programming in C++ / Advanced Templates / Design Patterns · Klaus Iglberger

2023–2024

Efficient Programming Series · HGS-HiRe School

2017–2018

CUDA, OpenCL, ZeroMQ, SIMD vectorization, OpenMP, GDB, Valgrind

LANGUAGES

Ukrainian — Native **English** — Fluent **German** — Intermediate