Mike Wilbert

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Profile

Core strengths: Scientific software development · HPC · Machine Learning

Expertise: C++/Python · MPI parallelization · Large-scale data analysis

Goal: Apply skills to real-world challenges in Data Science, ML Engineering, or Simulation Software

SKILLS

Programming

Python ●●●●
C/C++ ●●●●
FORTRAN ●●●
Git ●●●●
Linux ●●●

Languages

German (*native*)
English *C1** ●●●●●
French *B1** ●●●
Spanish *A1** ●

**Using CEFR rating for language proficency.*

ML & Data Science

NumPy ●●●●●
Pandas ●●●
scikit-learn ●●
TensorFlow/Keras ●●●
data visualization ●●●●

HPC & Performance

MPI ●●●●●
OpenACC/CUDA ●●●
optimization ●●●●

Tools & Workflow

GitHub/GitLab ●●●●
LaTeX ●●●●
CI/CD basics (GitHub Actions) ●●

Web Tech

HTML/CSS ●●●●
JavaScript ●●
PHP ●●

EDUCATION

Ph.D. (Physics)	2019 - 2023	Ruhr-University Bochum
M.Sc. (Physics)	2016 - 2019	Ruhr-University Bochum
B.Sc. (Physics)	2013 - 2016	Ruhr-University Bochum

PROJECTS

Turbulence	Implemented a pseudo-spectral solver for 2D turbulence, optimized with GPU acceleration for real-time visualization.
Kelvin–Helmholtz	Developed a finite-volume code for large-scale fluid simulations; parallelized for distributed HPC runs.

Further details available in my **port folio** at: mike-wilbert.com

EXPERIENCE

Postdoctoral Researcher	Developed a **finite-volume simulation code in C++/Fortran** for modeling complex fluid dynamics, optimized for **numerical stability and accuracy**. Implemented a **relativistic two-fluid plasma model** with advanced diagnostics, enabling deeper insights into high-energy processes. Enhanced and parallelized a **pseudo-spectral turbulence simulation framework (MPI, OpenACC/CUDA)** for large-scale HPC runs, improving scalability on supercomputing clusters. Conducted extensive **data analysis in Python (NumPy, SciPy)**.	2023 - now
PhD Researcher	Designed a **C++ pseudo-spectral solver with immersed boundary method**, simulating fluid flows in complex geometries. Applied the solver to model the **DRESDYN dynamo experiment** (Helmholtz-Zentrum), delivering insights into fluid–magnetic field interactions. Implemented **MPI-based parallelization** and optimized runtime performance for multi-node HPC clusters. Managed large simulation datasets (TB scale), developing **custom Python pipelines for analysis and visualization**.	2019 - 2023
Master's Research Project	Integrated a **Particle-in-Cell code** into a finite-volume solver (Fortran, C++), enabling simulations of **particle acceleration in reconnection scenarios**. Built tools in **Python for postprocessing**.	2018 - 2019