Curriculum Vitae

Fan Yang

Date of birth:	02.12.1993	**Place of birth:**	Shaanxi Province, China
Nationality:	Chinese	**Address:**	Am Steinknapp 66, Bochum, Germany
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EDUCATION

Hohai University; China 09.2012- 06.2016

Major: Engineering Mechanics

Four years program, ***Bachelor of Engineering***

*GPA: 3.98/5.0 (Average grade in the German grading system:**2.4**)*

Ruhr-Universität Bochum; Germany

Major: Computational Engineering, *Master Program*

GPA (Current): 2.5; Final Grade Expected to be Higher ~2.0

Expected Graduation: July 2026 10.2023-present

RESEARCH EXPERIENCE

MPI-based Parallelization and Optimization of a classical Molecular Dynamics Solver

- Engineered a production-grade Molecular Dynamics (MD) solver from scratch in C++ (featuring the Velocity-Verlet integrator) for large-scale physical simulation.
- *Implemented a robust Domain Decomposition strategy using MPI to achieve efficient load balancing, demonstrating expertise in distributing complex computational workloads critical for data-intensive ML pipelines.*
- *Optimized short-range force calculations to achieve high parallel scalability on HPC clusters, proving capability in low-latency, high-throughput computing essential for training or serving massive AI models.*

Quantum-Classical Hybrid Computing for Linear Systems

- *Conducted a comparative study of hybrid quantum-classical approaches to solving the linear system Ax=b by implementing both the HHL (Harrow–Hassidim–Lloyd) and VQLS (Variational Quantum Linear Solver) algorithms.*
- *Utilized the XACC Framework to orchestrate hybrid workflows, allowing the integration of multiple quantum backends (simulators and real hardware).*
- *Performed detailed performance and efficiency benchmarking against classical solvers, focusing on low-level compilation, IR transformations, and optimization, beyond high-level abstractions provided by common Python-based quantum SDKs.*

Object-Oriented Development of an Advanced Nonlinear FEM Solver in Java

- *Engineered an object-oriented Finite Element Method (FEM) solver from scratch in Java, establishing a modular and extensible architecture capable of handling linear 1D structural elements, with integrated post-processing modules for visualization of stress and strain distributions.*
- *The solver's architecture emphasizes abstraction and polymorphism, enabling flexible integration of new element types, material models, and boundary conditions.*
- *Implemented advanced nonlinear solvers, including the Newton–Raphson iteration and the generalized arc-length method, achieving robust convergence and stabilized solution paths in complex post-buckling phenomena (e.g., snap-through and snap-back responses).*

PUBLICATION

Fu, L., Yang, F., & Shi, Y. (2023). *Exploration and practice of a UDI-based management model [in Chinese]. China Medical Device Information.*

Contribution: *Second author. Led the conceptual design and system framework; coordinated cross-department collaboration to integrate six hospital information systems, enhancing data interoperability and integrity.*

PROFESSIONAL EXPERIENCE

Xiamen Cardiovascular Hospital, Xiamen University *Fujian, China | 2017 – 2023*

Algorithmic Design & Systems Architecture

- Designed and implemented predictive algorithms for medical consumable procurement and inventory optimization within the HRP system, translating complex clinical usage patterns into formal computational logic.

Data Integration / System Architecture

- Architected data integration across six heterogeneous hospital systems via unified UDI data interfaces, enhancing interoperability and data consistency at the system level.

Reliability & Risk Investigation

- Directed investigations into critical device-related failures (e.g., stent deformation, balloon dilation issues), integrating mechanical modeling, device metadata, and clinical data to identify root causes.

07.2016-05.2017

Xiamen International Bank, Corp. LTD; Fujian Province, China

- Completed intensive training focusing on quantitative risk analysis, gaining practical experience with complex data flows and structured decision-making processes in an operational environment.

AWARDS & CERTIFICATES

C Programming Language | National Computer Rank Examination 09.2015

Academic Progress Award and Scholarship | Hohai University 11.2014

SKILLS AND INTERESTS

- **Programming & Languages:** C++ (Expert in MPI parallelization and OOP), Java (OOP for solver development), Python (numerical analysis), MATLAB
- **HPC & Computational Methods:** MPI (domain decomposition), XACC framework, FEM solvers (Arc-Length method), Molecular Dynamics (MD) solvers, Numerical Linear Algebra
- **Tools & Environment:** Abaqus (structural modeling & simulation), Linux HPC environments, Git (version control)

- **Interests:** Guitar, hiking, cooking