Baudouin Fonkwa Kamga, Ph.D.

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Ann Arbor, MI (willing to relocate)

Summary

Available to start in February 2026. Ph.D. in Mechanical Engineering and Scientific Computing with academic and industry experience in numerical methods for multimaterial compressible flows, cavitation modeling, and computational fluid dynamics simulations. Skilled in numerical methods, high-performance computing (HPC), and machine learning, with a strong track record of interdisciplinary research applied to biomedical and energy systems. Effective communicator with experience teaching, publishing, and presenting at international conferences.

Technical Skills

Numerical Methods: Finite volume methods, finite element methods, spectral methods, time integration schemes (Runge-Kutta, Crank-Nicolson), numerical linear algebra, stability and convergence analysis
High Performance Computing: MPI, OpenMP, SLURM, job scheduling on HPC clusters
Programming: C/C++, Python, MATLAB, Fortran, VBA, Java
CAE/CFD Tools: ParaView, VisIt, Gmsh, SolidWorks, AutoCAD, ANSYS
Machine Learning: PyTorch, TensorFlow, NumPy, Pandas

Education

University of Michigan, Ann Arbor, MI
Ph.D. in Mechanical Engineering and Scientific Computing Dec 2025
Relevant Coursework: Computational Fluid Dynamics (CFD), Finite Element Analysis (FEA), Machine Learning

Ecole Centrale Nantes, Nantes, France
M.S. in Computational Mechanics Aug 2020

National Advanced School of Engineering, Yaoundé, Cameroon
M.Eng. in Mechanical Engineering Jul 2016

Research Experience

University of Michigan, Ann Arbor, MI
Graduate Student Research Assistant Aug 2021 – Jan 2026

- Developing numerical methods for multi-material (fluids and solids) compressible flows, with application to cavitation-induced deformations near a solid boundary.
- Simulating cavitation in viscoelastic media to establish injury thresholds for histotripsy and blast-induced traumatic brain injury.
- Conducting HPC - based simulations of cavitation in mercury for spallation neutron source applications.

Oak Ridge National Laboratory, Oak Ridge, TN
Summer Intern May – Jul 2022

- Extended a sub-grid cavitation model for mercury flow in the SNS target.

– Designed a modeling framework to study cavitation pitting in mercury.

University of Michigan, Ann Arbor, MI
Graduate Student Instructor, Fluid Mechanics 1 Aug – Dec 2023

– Led recitations and developed instructional material to support core fluid mechanics concepts.

– Evaluated student performance and provided targeted feedback on midterms and exams.

EDF Lab Paris-Saclay, Palaiseau, France
R&D Intern Mar – Aug 2020

– Designed test cases to validate finite volume code for cavitating flows in hydrodynamic bearings.

– Enhanced solver stability by optimizing initial guesses in Newton-Raphson iterations.

Industry Experience

FOMA Enterprise, Yaoundé, Cameroon
Mechanical Engineer Apr – Aug 2018

– Managed production and maintenance of a concrete batching plant; liaised with clients to improve service.

– Reduced production delays by automating reporting processes using Excel VBA.

PROMETAL Steelworks, Douala, Cameroon
Method and Maintenance Engineer Aug 2016 – Mar 2018

– Supervised 25 technicians in the development of a modern foundry facility.

– Performed CFD and FEA to ensure design integrity of mechanical systems.

– Oversaw system commissioning and ensured project timelines were met.

Honors and Awards

Mechanical Engineering Department Fellowship, University of Michigan Aug 2021
Centrale Nantes Elite Scholarship, Ecole Centrale Nantes Aug 2018

Conference Presentations

– **APS-DFD**, Houston, TX Nov 2025
A fluid-solid diffuse interface model with phase field for compressible viscoplastic flows

– **ICMF25**, Toulouse, France May 2025
Numerical simulation of the collapse of a cavitation bubble near a deformable solid

– **APS-DFD**, Salt Lake City, UT Nov 2024
Numerical investigation of solid surface deformation from bubble collapse

– **APS-DFD**, Washington, D.C. Nov 2023
Cavitation in the brain and its correlation to blast-induced injury

– **ICMF23**, Kobe, Japan Apr 2023
Rayleigh collapse of two bubbles near a wall: a numerical study

– **APS-DFD**, Indianapolis, IN Nov 2022
Maximum radius of a bubble in viscoelastic media under ultrasound pulses