Taha Bamhaoute

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Summary

Graduate engineer from ENSEIRB-MATMECA (Master of Engineering), specializing in Fluids and Energy, and holder of a Research Master MEFA (Master of Research in Fundamental Mechanics and Applications) from the University of Bordeaux. Currently a PhD student in Computational Fluid Mechanics at Claude Bernard University Lyon 1 and IFP Energies nouvelles, focusing on modeling and simulation of Newtonian and non-Newtonian fluid mixing in a twin-screw extruder, integrating polymer rheology, mesh adaptation, and high-performance computing, with applications in plastic recycling.

Education

2025–2028 **PhD in Computational Fluid Mechanics**, *Claude Bernard University Lyon 1 & IFP Energies nouvelles*, Lyon, France
Topic: Modeling and simulation of twin-screw extrusion with solvent injection for plastic waste recycling.
Research focus: Advanced CFD, polymer rheology, dynamic meshing, high-performance computing (HPC)

2022–2025 **Master of Engineering (Engineering Degree)**, *Bordeaux Institute of Technology - ENSEIRB-MATMECA School of Engineering*, Bordeaux, France
Department of Mathematics and Mechanics, specialization in Fluids and Energy.
Honors: High honors
Relevant courses: Acoustics, Finite Volumes, Fluid Mechanics, Continuum Mechanics, Linear Solvers, Turbulent Flow Modeling, Applied mathematics

2024–2025 **Master of Research (MEFA)**, *University of Bordeaux*, Bordeaux, France
Program in Fundamental Mechanics and Applications (parallel curriculum).
Honors: Highest honors, ranked 1/5

2020–2022 **Preparatory Classes for Grandes Écoles**, *Lycée Moulay Youssef*, Rabat, Morocco
Two-year intensive program in mathematics and physics, preparing for competitive engineering school entrance exams.

2019–2020 **High School Diploma**, *Les écoles scientifiques*, Témara, Morocco
Highest honors, Mathematics B track

Professional Experience

2025–2028 **Research Engineer / PhD Student**, *IFP Energies nouvelles*, Lyon, France
Research in computational fluid mechanics as part of PhD studies.
Responsibilities: Developing CFD models in OpenFOAM, polymer rheology studies, implementing dynamic mesh strategies, HPC simulations, experimental validation on a lab-scale twin-screw extruder and scale-up to industrial processes.

Apr 2025 – Sep 2025 **Master's Thesis Internship**, *IFP Energies nouvelles*, Lyon, France
- Developed an OpenFOAM solver for simulating miscible mixing of Newtonian and non-Newtonian fluids for plastic recycling applications
- Integrated heat transfer modeling
- Validated the model against experimental data from literature

Jul 2024 – Sep 2024 **Research Internship**, *LAMFA / University of Picardie Jules Verne*, Amiens, France
- Error estimation and optimization of numerical methods for Density Functional Theory (DFT)
- Applied to electronic structure calculations in condensed matter physics
- Programming with Julia and DFTK library

Jun 2023 – Jul 2023 **Discovery Internship**, *Alstom Flertex*, Gennevilliers, France
- Explored the production chain
- Analyzed three years of sales data
- Structured the inventory of brake pads based on the data analysis

Academic and Scientific Projects

Industrial Project – CFD Simulation of a Liquid Sodium Bath, *CEA Cadarache / Matmeca*
- Numerical modeling (CFD) of convection and thermal phenomena in a sodium bath
- Studied thermal stability and localized boiling risks
- Used OpenFOAM and Fluent for simulations

Paper Airplane Flight Dynamics Simulation with Fluent
- Built paper airplane geometries
- Simulated in ANSYS Fluent to optimize performance
- Analyzed the effects of angle of attack and wing shape on aerodynamic forces

Coastal Wave Propagation Modeling
- Solved 2D Saint-Venant equations numerically
- Validated code with lab and field measurement data

2D Advection-Diffusion Equation Simulation
- Simulated heat diffusion in a thermal resistor
- Applied to a kettle with three heating elements

Conservative System Modeling
- Simulated and analyzed single, double, spring-coupled, and coupled pendulums in Fortran
- Studied oscillations, energy, and phase portraits
- Implemented explicit, implicit, and Runge-Kutta numerical schemes

Skills

Programming	Julia, C++, Fortran, Python, MATLAB, Bash, LaTeX
Simulation	OpenFOAM, ANSYS Fluent, ParaView, FreeCAD, Gmsh, Pointwise
Software	Microsoft Office, Linux

Languages

Arabic	Native
French	C1
English	B2 (TOEIC)
Spanish	A1