

Jacopo Bilotto

DOCTORAL ASSISTANT IN COMPUTATIONAL MECHANICS

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Professional Summary

PhD Researcher in Computational Mechanics specializing in surrogate modeling, physics-informed machine learning, and physics-based simulations. Proven expertise in developing particle solvers, JAX-based forward models, custom neural architectures, and Gaussian Process Regression for industrial optimization and inverse design. 5+ years of experience bridging high-fidelity physics (DEM/FEM/BEM) with ML frameworks to accelerate engineering design cycles.

Technical Skills

Simulation	Abaqus (User Subroutines), Ansys, Comsol Multiphysics, LAMMPS (HPC), Tamaas
Programming	Python (NumPy, PyTorch, Jax), C++, MATLAB, $\text{\LaTeX}$
Tools	Git, Linux/Unix (Bash), CMake, MPI, GitHub Actions (CI/CD), ParaView, Ovito
Languages	Italian (Native), English (C1+ Cambridge CAE), French (B2)

Experience

EPFL (Laboratory of Computational Solid Mechanics)

Lausanne, Switzerland

DOCTORAL ASSISTANT (RESEARCHER)

Mar 2023 – Present

- Architected a **GPR surrogate model** trained via Latin Hypercube Sampling (LHS) to optimize rice milling machinery for **Bühler AG**, reducing grain breakage by up to 30
- Implemented superellipsoidal particle support in the LAMMPS (C++) source code to enable high-fidelity granular simulations, for thousands of users worldwide.
- Developed a hybrid **Scientific Machine Learning** (SciML) framework for the automated inverse design of functional metainterfaces, utilizing differentiable contact mechanics and deep neural surrogates to engineer programmable friction laws with <1% error relative to high-fidelity BEM simulations.
- Quantified particle shape effects in dense granular flows and identified statistical framework for predictive results.
- Developed a high-performance elastohydrodynamic (EHD) simulation framework using **JAX**, achieving an 80x throughput increase for large-scale parametric studies.
- Technical and project lead for 9 student research projects, managing project timelines and methodology for topics ranging from fluid-mediated impacts to graph neural simulators.

ASML

Eindhoven, Netherlands

SIMULATION INTERN (TRIBOLOGY & SURFACE SCIENCE)

Apr 2022 – Dec 2022

- Validated FE models against nano-indentation experiments, achieving a load-displacement match with **<5% error**.
- Engineered a spring-based analytical model to enable rapid design assessment of nanostructured thin-film architectures.
- Modeled multilayer coating failure and delamination using cohesive elements in **Ansys** to predict microscale mechanical reliability.

INFN (National Institute of Nuclear Physics)

Frascati, Italy

RESEARCH & TECHNICAL STUDENT

Sep 2021 – Nov 2021

- Coded LabView control systems for electrical cannons, reducing filament thermal stress
- Reduced data post-processing time by **70%** through the development of automated Python-based workflows.

Leadership

LauzHack (EPFL Hackathon)*Lausanne, Switzerland*

COMMITTEE MEMBER & SPONSORING LEAD

Apr 2023 - Nov 2025

- Managed corporate partnerships and raised **60K CHF annually** from sponsors including AWS, Logitech, and Bristol Myers Squibb.
- Negotiated contracts and managed technical requirements for three hackathons involving 500 total participants.

Mechanics Gathering Seminar (MEGA)*Lausanne, Switzerland*

LEAD ORGANIZER & MEMBER

Feb 2024 - Present

- Lead organizer for two semesters, coordinating weekly technical seminars for early-career researchers in mechanics at EPFL.
- Managed speaker invitations and logistics to foster inter-laboratory research exchange.

Education

EPFL*Switzerland*

PHD IN MECHANICS

*Expected Feb 2027*Recipient of the **EPFL Global Leaders Fellowship** (MSCA programme, €92,880).**Sapienza, University of Rome***Italy*

M.S. & B.S. IN MECHANICAL ENGINEERING

*2017 - 2023***Cum Laude** (GPA: 29.8/30). Ranked in the **Top 3** students of the year through the Sapienza Honors Program.