Hugo BOULENC

Curriculum Vitae

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Professional Experience

2026 – present **Freelance in Machine Learning & Data Science for Physics**, *Freelance*, Montpellier, France.
I help companies and research teams leverage complex data from physical phenomena, build fast surrogate models to accelerate simulations, and combine data with physical models to improve predictions. I'm committed to projects with real-world impact, especially in environment, climate urgency, and social equity.

2020 – 2021 **Consulting Aerospace Engineer**, *CNES / ALCADIA*, Paris & Toulouse, France.
Modelization of Cryogenics Systems for the reusable launcher demonstrator Themis.

2020 **Internship in Fluid Dynamics and Machine Learning**, *ArianeGroup*, Les Mureaux, France.
Development of a surrogate model based on CFD calculations and Machine Learning for Ariane 6.

Education

2022 – present **PhD student in Applied Mathematics**, *INSA Toulouse / Institut de Mathématiques de Toulouse*, Toulouse, France.
PhD student in Applied Mathematics on Physics-Informed Machine Learning methods applied to hydraulics and hydrology models for floods simulation. Supervised by J. Monnier (INSA Toulouse/IMT), P.-A. Garambois (INRAE Aix-en-Provence) and R. Bouclier (INSA Toulouse/ICA/IUF) at INSA Toulouse.

2019 – 2020 **Specialization Degree in Mechanics, Aeronautics and Aerospace Engineering**, *Centrale-Supélec*, Gif-sur-Yvette, France.
Final year of the "Ingénieur Centralien" curriculum, advanced courses in Fluid Dynamics.

2015 – 2020 **Msc in General Engineering, major in Aeronautics and Aerospace**, *EPF École d'Ingénieur-e-s*, Montpellier & Sceaux, France.
Exchange Semester with Polytechnique Montréal in Fluid Dynamics & Heat Transfer Science.

Teaching Experience

2022 – 2024 **Teaching Assistant**, *INSA Toulouse*, Toulouse, France.
Tutorial and Practical Sessions in Data Assimilation, PDE and Fourier Analysis for 2nd to 5th year students.

Publications

2025 **H. Boulenc**, R. Bouclier, P.-A. Garambois and J. Monnier (2025). Spatially-distributed parameter identification by physics-informed neural networks illustrated on the 2D shallow-water equations. *Inverse Problems.*.

Conferences & Workshops

2025 **DTE & AICOMAS**, Paris, France.
Mini-Symposium presentation.

2024 **ECCOMAS**, Lisboa, Portugal.
Mini-Symposium presentation.

2024 **ANITI Days**, Toulouse, France.
Poster co-presentation with M. Allabou.

2024, 2025 **ANITI Chair PILearnWater Plenary Session**, Toulouse, France.

2022 – 2024 **ANR MUFFINS Plenary Sessions**, Aix-en-Provence & Toulouse, France.