Hugo BOULENC

Resume

GMM Department, INSA Toulouse
Institut de Mathématiques de Toulouse
hugo.boulenc@insa-toulouse.fr
GitHub Page *LinkedIn*

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 Mechanical Engineering.

Professional Experience

2020 – 2021 **Consulting Aerospace Engineer**, *CNES / ALCADIA*, Paris & Toulouse, France
Consulting Engineer for a mission consisting in the modelization of Cryogenics Systems for ground operations on the reusable launcher demonstrator Themis, developed by ArianeWorks.

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 convective heat transfer prediction on Ariane 6.

Teaching Experience

2022 – 2024 **Teaching Assistant**, *INSA Toulouse*, Toulouse, France
Tutorial and Practical Sessions in Data Assimilation, PDE and Fourier Analysis for 2^{nd} to 5^{th} 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
Physics-Informed Machine Learning for Parameter Identification on Shallow-Water Equations, Mini-Symposium presentation.

2024 **ECCOMAS**, Lisboa, Portugal
Inverse Problems for Shallow-Water Equations solved by Physics-Informed Machine Learning methods, Mini-Symposium presentation.

2024 **ANITI Days**, Toulouse, France
Surrogate direct and inverse models for river hydraulics with hybrid Physics-Neural Networks methods, Poster co-presentation with Mustapha Allabou.

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

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