Gabriel Fougeron

PhD, Research & Innovation Specialist

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Professional Experience

Since 2015 **Research engineer**, *ESI-Group*, Software Publisher, specialized in Simulation and Virtual Prototyping, Rungis, France.

- **PhD thesis** *(3 years)*: Joint funding with the French public agency *ANRT*.
- Leader of the **Horizon 2020** EU project **MADELEINE** *(3 years)*
  - Development and implementation of coupling methods for Fluid Structure Interaction.
  - AeroStructural adjoint optimization of a business jet aircraft wing.
  - Simulation and Optimization of the manufacturing of a high-pressure turbine blade.
- Development and implementation of methods for industrial-scale mesh morphing.
- Development of optimal transport GPU-accelerated tools for Reduced Order Modelling and fast interpolation in parametric space.

Feb – Jul 2013 **Research intern**, *Indian Institute of Technology Bombay*, Mumbai, India.
Development of a parallel (MPI) auto adaptive meshless DSMC code. Application to the simulation of heat exchange and sizing of the heat shield of re-entry vehicles.

Jul 2012 – Jan 2013 **R&D intern**, *Air Liquide*, Industrial gas world leader, France.
Redesign of the thermodynamic model and development of a modelling and simulation code for the filling process of gas vessels. Comparison with in-situ measurements and optimization of the filling process.

Education

2015 – 2018 **PhD in Applied Mathematics**, *CentraleSupélec, Université Paris-Saclay*, France.
Title: Contribution to the improvement of meshless methods applied to continuum mechanics.

- Built a common theoretical framework to analyze and compare meshless discretizations.
- Designed conditions for conservation and consistency of operator-based discretizations.
- Applications to the simulation of crack initiation and propagation.

2010 – 2014 **Master's level engineering school**, *École Centrale Paris*, France.
Specialised in Numerical Analysis, Simulation and Optimization.

Language and computer skills

Programming Numerical programming (FORTRAN, C++, Python, Cython).
Shared (OpenMP) and distributed-memory (MPI) parallel programming, GP-GPU acceleration (PyTorch).

French Native language.

English Fluent. C2 equivalent in the CEFR.

Selected Publications

Hughes-Allen, L., Bouchard, F., Séjourné, A., Fougeron, G., & Léger, E. (2023). Automated identification of thermokarst lakes using machine learning in the ice-rich permafrost landscape of central Yakutia (Eastern Siberia). *Remote Sensing*, *15*(5), 1226.

Fougeron, G., & Kamoulakos, A. (2019). An adaptive tree structure for the discrete integration of the weak forms arising in the meshless simulation of elliptic equations. *Proceedings of the 2019 NAFEMS World Congress*.

Fougeron, G., & Aubry, D. (2019). Imposition of boundary conditions for elliptic equations in the context of non boundary fitted meshless methods. *Computer Methods in Applied Mechanics and Engineering*, *343*, 506–529.