

Gabriel Fougeron

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PhD, Senior Research & Innovation Specialist

Professional Experience

- Since 2015 **Senior Research & Innovation Specialist**, *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 – **R&D intern**, *Air Liquide*, Industrial gas world leader, France.
- Jan 2013 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.