CERFACS

JOB OFFER – POST-DOCTORAL

SANTANA Project: Development and integration of distributed anisitropic mesh adaptation

OFFER INFORMATION

Reference: 2024-MPK-02
Team: ALGO

Location: 42 Avenue Gaspard Coriolis – 31057 Toulouse
Contact person: Antoine DAUPTAIN

Period: 1 year - from: 03/03/2025
Salary: 40 K€/year (gross)
Level of education required: PhD or equivalent

Key words: Anisotropic Mesh Adaptation, HPC, Goal-based Error Metrics, Computational Fluid Dynamics, Unstructured Meshes, RANS

CERFACS

Cerfacs is a private research, delevopment, transfer and training center for modeling, simulation and high-performance computing. Cerfacs designs, develops and proposes innovation software methods and solutions to meet the needs of its partners in the aeronautics, space, climate, environment and energy sectors. Cerfacs trains students, researchers and engineers in simulation and high-performance computing.
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HOSTING TEAM - ALGO

Within the Algo-COOP team, the Algo group conducts research in the fundamentals of high performance simulation. This includes a wide range of topics in applied mathematics, such as scalable algorithms in numerical linear algebra, iterative and direct algorithms for large linear systems, novel methods for solving partial differential equations, data assimilation, optimisation, uncertainty quantification and scientific machine learning.

CONTEXT

There is a growing need to revolutionize aerodynamic design processes within the aircraft industry by significantly reducing computational lead times and enhancing the accuracy and reliability of simulations through autonomous numerical error-driven mesh adaptation techniques. By leveraging and integrating advanced distributed mesh adaptation frameworks and metric-based remeshing libraries, this project will enable aerospace engineers to explore a broader design space with higher confidence, ultimately contributing to the innovation and efficiency of future aircraft configurations.

MISSION

The mission of this post-doctoral position is to develop a cutting-edge parallel anisotropic mesh adaptation framework for integration within the CODA CFD solver developed by Onera, Airbus and DLR. The adaptation infrastructure is strategized by leveraging the KalpaTARU distributed mesh adaptation library (developed at CERFACS) and the Tucanos metric-based remeshing library (developed at Airbus). The candidate is expected to work in close collaboration with a PhD student on the same theme to accelerate the research and development.

DESIRED PROFILE

- You have defended your thesis less than 3 years from the date of this job offer.
- PhD in Computational Fluid Dynamics, Applied Mathematics, or related fields.
- Experience in mesh generation and adaptation, parallel computing, and CFD software development.
- Proficiency in programming languages C++, Rust, and Python.
- Familiarity with HPC environments and performance optimization.

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- Broad access to technology, a rich interpersonal environment, in-house skills recognized nationally and internationally.
- An inclusive and equitable work environment.
- A structure accessible to people with disabilities.
- A complementary health insurance scheme offering excellent health care coverage in addition to social security, with the possibility of enrolling family members (spouse and children).
- 6 weeks' annual leave (with the possibility of 22 extra days' leave per year linked to your choice of a 39-hour rather than 35-hour working week).
- Flexible working arrangements, with the possibility of working from home up to two days a week.
- A sustainable mobility package enabling employers to pay up to a maximum of 500 euros a year to cover the home-to-work travel costs of staff who cycle to work.

HOW TO APPLY ?

To apply, please send your CV and covering letter to antoine.dauptain@cerfacs.fr, applications are open until 31/05/2025.

See you soon at CERFACS!