

JOB OFFER – POST-DOCTORAL
SANTANA Project: Development and integration of distributed anisotropic mesh adaptation

OFFER INFORMATION

Reference: 2024-MPK-02

Team: ALGO

Location: 42 Avenue Gaspard Coriolis – 31057 Toulouse

Contact person: MOHANAMURALY Pavanakumar

Period: 1 year - from: 20/11/2024

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, development, 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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HOW TO APPLY ?

To apply, please send your CV and covering letter to mpkumar@cerfacs.fr, applications are open until 03/03/2025.

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