



Offre n°2023-06079

Post-Doctoral Research Visit F/M High Performance Solver for Aeroacoustics

Type de contrat : Fixed-term contract

Niveau de diplôme exigé : PhD or equivalent

Fonction : Post-Doctoral Research Visit

Niveau d'expérience souhaité : Recently graduated

A propos du centre ou de la direction fonctionnelle

The Inria center at the University of Bordeaux is one of the nine Inria centers in France and has about twenty research teams. The Inria centre is a major and recognized player in the field of digital sciences. It is at the heart of a rich R&D and innovation ecosystem: highly innovative SMEs, large industrial groups, competitiveness clusters, research and higher education players, laboratories of excellence, technological research institute...

Contexte et atouts du poste

Within the framework of the MAMBO project financed by the DGAC (French Civil Aviation Administration), Inria is recruiting a post-doctoral researcher within the CONCACE team for a period of 2 years at the Inria center at the University of Bordeaux. The objective is to continue and industrialize work from a previous PhD on the high performance solution of linear systems from aero-acoustics. As the CONCACE team is shared between Inria, Cerfacs (Toulouse) and Airbus Central R&T (Issy-Les-Moulineaux and Toulouse), travel will be possible between these sites (travel expenses will be covered within the limits of the current scale).

Mission confiée

In the prolongation of Marek Felsoci's thesis, the candidate will be led to resume and extend this work devoted to the efficient solution of linear systems with dense and sparse parts. For dense linear systems, the most efficient approaches are based on hierarchical matrices (H-matrices <https://www.theses.fr/2014PA132030>) with low rank compression. For sparse linear systems, approaches based on nested dissection are used instead. The goal of this post-doc is to test two promising approaches:

- either use H-matrices for the whole dense+sparse system, using nested dissection on the sparse part ;
- or mix two different softwares (h-mat and qrm https://gitlab.com/qm_mumps/qm_mumps) to treat the dense and sparse parts.

In all cases, task-based parallelism will be used via the StarPU runtime engine (<https://starpu.gitlabpages.inria.fr/>). The subject will be done in collaboration with the Airbus acoustics teams to validate the approaches on industrial cases.

Principales activités

Main activities :

- Bibliography and understanding of existing algorithms;
- Programming, testing, validation of new methods;
- Realization of industrial tests and scaling up in parallel;
- Writing documentation, scientific reports, research articles;
- Presentation in the framework of the MAMBO project and in scientific conferences.

Additional activities :

(if desired) teaching and managing interns

Compétences

Technical skills and level required: 5 years or more of higher education or equivalent, master or

engineering degree or PhD in applied mathematics or computer science with a scientific computing component.

Languages: the working language will be mainly French, but English will be used in exchanges with non-French speaking team members or collaborators.

Interpersonal skills: enjoy working and interacting in a collaborative research environment, curiosity and creativity.

Additional skills: writing scientific papers and public presentations of results.

Avantages

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of partial teleworking and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities

Rémunération

Fixed-term contract, gross monthly remuneration (before taxes and monthly income tax deduction): 2746 euros

Informations générales

- **Thème/Domaine** : Distributed and High Performance Computing
Scientific computing (BAP E)
- **Ville** : Talence
- **Centre Inria** : [Centre Inria de l'université de Bordeaux](#)
- **Date de prise de fonction souhaitée** : 2023-10-01
- **Durée de contrat** : 2 years
- **Date limite pour postuler** : 2024-06-30

Contacts

- **Équipe Inria** : [CONCACE](#)
- **Recruteur** :
Sylvand Guillaume / Guillaume.Sylvand@inria.fr

A propos d'Inria

Inria est l'institut national de recherche dédié aux sciences et technologies du numérique. Il emploie 2600 personnes. Ses 215 équipes-projets agiles, en général communes avec des partenaires académiques, impliquent plus de 3900 scientifiques pour relever les défis du numérique, souvent à l'interface d'autres disciplines. L'institut fait appel à de nombreux talents dans plus d'une quarantaine de métiers différents. 900 personnels d'appui à la recherche et à l'innovation contribuent à faire émerger et grandir des projets scientifiques ou entrepreneuriaux qui impactent le monde. Inria travaille avec de nombreuses entreprises et a accompagné la création de plus de 200 start-up. L'institut s'efforce ainsi de répondre aux enjeux de la transformation numérique de la science, de la société et de l'économie.

L'essentiel pour réussir

The candidate should be interested in programming in general (C, C++, fortran, compilation, scripting, python), and digital sciences and high performance computing in particular. Teamwork, both locally and remotely, will be part of the daily routine of this job.

Attention: Les candidatures doivent être déposées en ligne sur le site Inria. Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.

Consignes pour postuler

We thank you for applying through your candidate area by submitting the following documents:

- CV with list of publications
- letter of motivation
- letters of recommendation

Sécurité défense :

Ce poste est susceptible d'être affecté dans une zone à régime restrictif (ZRR), telle que définie dans le décret n°2011-1425 relatif à la protection du potentiel scientifique et technique de la nation (PPST). L'autorisation d'accès à une zone est délivrée par le chef d'établissement, après avis ministériel favorable, tel que défini dans l'arrêté du 03 juillet 2012, relatif à la PPST. Un avis ministériel défavorable pour un poste affecté dans une ZRR aurait pour conséquence l'annulation du recrutement.

Politique de recrutement :

Dans le cadre de sa politique diversité, tous les postes Inria sont accessibles aux personnes en situation de handicap.