A propos du centre ou de la direction fonctionnelle

The Inria Grenoble - Rhône-Alpes research center groups together almost 600 people in 22 research teams and 7 research support departments.

Staff is present on three campuses in Grenoble, in close collaboration with other research and higher education institutions (Université Grenoble Alpes, CNRS, CEA, INRAE,...), but also with key economic players in the area.

Inria Grenoble - Rhône-Alpes is active in the fields of high-performance computing, verification and embedded systems, modeling of the environment at multiple levels, and data science and artificial intelligence. The center is a top-level scientific institute with an extensive network of international collaborations in Europe and the rest of the world.

Contexte et atouts du poste

The candidate will join the DataMove INRIA team located on the campus of the Univ. Grenoble Alpes near Grenoble. The DataMove team is a friendly and stimulating group with a strong international visibility, gathering Professors, Researchers, PhD and Master students all pursuing research on High Performance Computing.

This work is part of a joint collaboration with international industrial and academic partners. This work experience will bring you skills related to high performance computing and deep learning that are in high demand.

Hiring date is flexible, starting as early as September 2023. Initial contract is for 3 years, with money already secured for an extra 2 years extension.

The city of Grenoble is surrounded by the Alps mountains, offering a high quality of life and where you can experience all kinds of mountain related outdoor activities and more.

Principales activités

Our team develops Melissa (https://gitlab.inria.fr/melissa), a framework running on supercomputers for managing an ensemble of simulations (several executions of the same simulation code) with an on-line processing of the data produced by these simulations.

Melissa has been the support of innovative research works. Very recent success is the paper at the ICML 2023 conference, a leading AI conference. Melissa has been used to explore sensitivity analysis (statistics), data assimilation (steering of the ensemble from observation data) or training deep surrogates (deep neural network).

Melissa has run on several supercomputers like Jean-Zay (Fr), Juwels (De), MareNostrum (Sp), and Fugaku (Sp), one of the fastest supercomputer in the world (https://top500.org/lists/top500/).

Melissa is a sophisticated code that supports fault-tolerance, elastic executions (can change the number of cores used at runtime), dynamics load balancing. Melissa supports different simulation codes and different data processing libraries like PDAF for data assimilation or PyTorch and TensorFlow for deep neural network training.

Melissa has been the support of innovative research works. Very recent success is the paper at the ICML 2023 leading AI conference

Melissa is mainly based on Python with C/C++ and sometimes Fortran used in third party simulation or data processing libraries. Melissa development process with issue tracking, continuous integration, testing on virtual supercomputers made of containers, HPC specific packaging (Spack, Guix, Nix),...

We are looking for a candidate that will join the Melissa team for:

1. Consolidating and extending Melissa, addressing issues like high performance messaging, support of new data processing libraries, performance optimization, new feature development.
2. Run experiments on a variety of supercomputers like Jean-Zay at idris, as well as smaller ones for prototyping.
3. Participate to the research activity related to Melissa working with PhD students and other researchers involved. For instance we are considering extending Melissa for supporting active learning or integrating support for neural Bayesian inference (often called Simulation Based Inference).

Through this work the candidate will gain strong expertise in high performance computing, high performance data analysis and deep learning. She/he will integrate a dynamics research team and have the opportunity to work at an international level with other Melissa contributors and users.

Informations générales

- **Thème/Domaine**: Calcul distribué et à haute performance
- **Ville**: Montbonnot
- **Centre Inria**: Centre Inria de l'Université Grenoble Alpes
- **Date de prise de fonction souhaitée**: 2023-10-01
- **Durée de contrat**: 3 ans
- **Date limite pour postuler**: 2023-08-20

Contacts

- **Équipe Inria**: DATAMOVE
- **Recruteur** : Raffin Bruno / bruno.raffin@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 200 équipes de projets, agiles, en général communes avec des partenaires académiques, impliquent plus de 3 500 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 180 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.

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

**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** :
References:
- Melissa git repos: https://gitlab.inria.fr/melissa
- Paper Melissa & deep learning: https://icml.cc/Conferences/2023/Schedule?showEvent=24551
- Paper Melissa & sensibility analysis: https://hal.inria.fr/hal-01607479v1
- Paper Melissa & data assimilation: https://hal.archives-ouvertes.fr/LIG/hal-03017033v2

Compétences
We welcome candidates with a master (or equivalent title) in computer science, some experience with parallel programming, distributed systems and deep learning, numerical solvers.

No previous work experience required as long as you are motivated and ready to train yourself to complement your skills.

Experienced candidates are very welcome with income adjusted to your experience.

Candidates with a PhD that are looking to complement their experience before going to the industry are also welcome.

Expected technical skills include Linux, Python and some C/C++ programming practice, a good mastering of development processes is a plus (git, continuous integration, containers, etc.).

A reasonable level of English is required. French is not mandatory and INRIA will provide French classes if needed.

To apply submit your CV, references, recent marks, and if available your last Internship/Master Thesis manuscript. With your application provide any element (github account, code snippets, etc.) that could help us assess your skills beyond your academic record, as well as a few references of persons we can contact to get some feedback on your qualities.

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 teleworking and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage under conditions

Rémunération
From 2,562 euros gross salary /month before income taxes depending on work experience and degrees