

Offer #2024-07519

Development & Research Engineer @ Grenoble: Deep and Shallow Data Processing on Supercomputers

Contract type : Fixed-term contract

Renewable contract : Yes

Level of qualifications required : Graduate degree or equivalent

Fonction : Temporary scientific engineer

Level of experience : Recently graduated

About the research centre or Inria department

The Centre Inria de l'Université de Grenoble 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.

The Centre Inria de l'Université Grenoble 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.

Context

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 experience will bring you skills from high performance computing up to deep learning that are in high demand.

This work is part of a joint collaboration with international academic partners, giving you the opportunity to work in an international context.

Hiring date is flexible, starting as early as September 2024. Initial contract is for 30 months, with possibilities for 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 outdoors activities and more.

Main activities

Dask (<https://www.dask.org/>) and Ray (<https://www.ray.io/>) are open source frameworks to distribute the execution of Python tasks on actors on supercomputer and cloud. They provide seamless parallelization of classical data processing libraries like Numpy (<https://numpy.org/>), Panda (<https://pandas.pydata.org/>) or Scikit-learn (<https://scikit-learn.org/>), making them popular in the scientific data analytics and machine learning communities.

We developed Deisa (code: <https://github.com/GueroudjiAmal/deisa> - PhD: <https://theses.hal.science/tel-04194958>) to extend Dask with classical parallel applications based on MPI. The data produced by each MPI process of the application are routed as soon as available to Dask workers that can execute tasks to process these data. Users can then conveniently rely on classical Python libraries like Numpy to process efficiently large amount of data.

We are looking for a candidate that will join our team for:

- Consolidating and extending Deisa, for instance to improve data transfer speed, or adding novel features for JAX (<https://github.com/google/jax>) and Pytorch (<https://pytorch.org/>) support.
- Study the feasibility of a Deisa variation for Ray. Ray is similar to Dask, but adopted a very different implementation.
- Develop prototype data processing pipelines for two specific applications: Gysela (plasma simulation code - <https://gysela.github.io/>), and Parflow (water flow simulation - <https://parflow.org/>). Required data processing ranges from classical linear algebra to shallow machine learning or deep neural networks.

- Run experiments on a variety of supercomputers
- Participate to the research activity, possibly leading to publications.
- Collaborate with other European partners as this work is part of the European project Eocoe-III (<https://www.eocoe.eu/>).

Through this work the candidate will gain strong expertise in high performance computing, high performance data analysis up to deep learning. She/he will integrate a dynamics research team and have the opportunity to work in an international context.

Skills

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

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

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 are also welcome.

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.

Benefits package

- 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 (90 days / year) and flexible organization of working hours (except for internship)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage under conditions

Remuneration

From 2,692 € (depending on experience and qualifications).

General Information

- **Theme/Domain** : Distributed and High Performance Computing
Scientific computing (BAP E)
- **Town/city** : Saint Martin d'Heres
- **Inria Center** : [Centre Inria de l'Université Grenoble Alpes](#)
- **Starting date** : 2024-09-01
- **Duration of contract** : 2 years, 7 months
- **Deadline to apply** : 2024-05-31

Contacts

- **Inria Team** : [DATAMOVE](#)
- **Recruiter** :
Raffin Bruno / bruno.raffin@inria.fr

About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

Warning : you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.

Instruction to apply

Defence Security :

This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST). Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

Recruitment Policy :

As part of its diversity policy, all Inria positions are accessible to people with disabilities.