Compute and Data Team member @ ExaDI-NumPEx
Contract type: annual (2-3 years), possibility of tenure track (permanent)
Location: Paris region

About Us

Exa-DI project is one of the five projects of the PEPR NumPEx (Numérique haute Performance pour l'Exascale), which is funded by the French government, and led by CEA, CNRS and INRIA.

Launched in 2023 for a duration of 6 years, NumPEx aims to contribute to the design and development of numerical methods and software components that will equip future European Exascale and post-Exascale machines. NumPEx also aims to support scientific and industrial applications in fully exploiting the capabilities and the potentials of these new architectures. Application domains of the NumPEx program include, but are not limited to, weather forecasting and climate, aeronautics, automotive, astrophysics, high energy physics, material science, energy production and management, biology and health.

The focus of the Exa-DI project is to accelerate development of exascale applications, by proposing "software development kits" - based on the NumPEx software stack - that can be easily deployed and instantiated in many ways and that provide sustainable, performant, and portable solutions to the most important computational and communication algorithmic motifs encountered in exascale applications. These motifs are adressed in an iterative co-design and co-development process

In this context, Exa-DI is seeking **highly motivated scientific HPC software developers** who can contribute to addressing the various computation and communication algorithmic motifs and are willing to embrace Agile responsibilities.

Mission and responsibilities

The candidates will join an Agile team of ~10 engineers and, depending on their skills & expertise, will contribute to one or several of the cross-cutting computation and communication algorithmic motifs identified so far:

- Efficient PDE-based discretisation @ exascale,
- Block-structured Adaptive Mesh Refinement @ exascale,
- Particle-based methods @ exascale,

In this context, the mission and responsibilities of the job are:

- Collaborate with scientific and industrial application teams to define mini- and proxy-apps that are representative of the technical bottlenecks encountered in exascale applications,
- Develop these mini- and -proxy apps by bringing together added-value software components (libraries, frameworks, tools) provided by other NumPEx research teams,
- Strengthen the use of portable accelerator programming models and abstraction layers addressing the specific challenges of each computation and communication motif,
- Develop benchmark tests & metrics to assess performance gain, scalability and interoperability of proposed solutions,
- Integrate, package and deliver logical collections of software components, in the form of software development kits ,
- Foster knowledge transfer towards scientific and industrial application teams by providing training and support on released SDKs, mini- and proxy-apps, and associated best practices,

- Support the self-organisation & overall performance of the Agile Team by actively contributing to process definition & improvement, planning & executing the iterations, demonstrating the progress, coordinating with other Teams & stakeholders, managing risks & impediments, ...

Required Education and Experience

- Masters or PhD degree in Computer Science, Engineering, or related discipline,
- Expertise in Python, C/C++, Fortran,
- Knowledge of parallel programming (GPU, multi-threaded, etc.) is desirable,
- Practical problem solving and strategic thinking skills, critical thinker, and self-starter,
- Ability to work successfully with demanding schedule constraints and technically challenging programs
- Excellent Communications skills including written reports
- Proficiency in English
- Ability and motivation in working with different application teams & multiple application domains

Salary and Benefits Package

We offer a very competitive salary in the French research ecosystem, indexed on diplomas and experience. In addition, the position will benefit from various advantages:

- Possibility through NumPEx to leverage existing and develop new collaborations in Europe, US and Japan as well as participating in international conferences with support for travel,
- Access to vocational training and certification on Agile/SAFe
- Up to 3 days of remote work per week, and flexible organisation of working hours,
- Partial reimbursement of public transport costs and subsidised catering meal service,
- Pension plan and health coverage (French social security and specific insurance) under conditions,
- Leave: 8 full weeks of annual leave + extra days off due to the RTT French law (statutory reduction in working hours) + possible exceptional leave (sickness, children, moving home, etc.)
- Professional equipment (videoconferencing, personnel computer, etc.),

Contact

For further information, please contact

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In order to apply, please send a resume, cover letter, references and support letters to these contacts.