Offre n°2025-09205

Research software engineer

Type de contrat : Fixed-term contract

Contrat renouvelable : Oui

Niveau de diplôme exigé : Graduate degree or equivalent

Autre diplôme apprécié : PhD

Fonction : Temporary scientific engineer

Niveau d'expérience souhaité : From 3 to 5 years

Contexte et atouts du poste

The QAT (Quantum computing Architectures, Algorithms, Applications, and their Theory) team is hiring one software research engineer.

QAT is a new team at the Inria Paris research center. It focuses on a variety of topics, ranging from quantum computing to cryptography and error correction, while considering the diversity of existing physical platforms.

In terms of software development, the team's overarching philosophy is to develop tools that facilitate the exploration of algorithms and protocols in analytically unattainable regimes, to better understand and improve them.

The team’s projects span multiple levels of the quantum software stack (machines and simulators), including:

- **Low-Level Software:**
  - Creating software environments and tools for operating quantum machines.
  - Developing simulators for the measurement-based computing model. This open-source, international project addresses topics like noise simulation, simulator efficiency, software performance, pre-processing, compilation, and HPC implementation.
  - Developping simulation tools for quantum-network-based applications

- **Intermediate Level:**
  - Noise estimation libraries.
  - Benchmarking libraries for quantum machines or software environments simulating quantum machines.

- **High-Level Software:**
  - Libraries for verified quantum computation.
  - Tools for variational quantum computing.

As part of Inria (National Institute for Research in Digital Science and Technology), the QAT team is one of the institute's key contributors to France's National Quantum Technology Strategy. The team co-leads various research funding tools such as the Priority Research Program and Equipment initiative (PEPR) "Quantum" and the "Hybrid Quantum Initiative" (HQI) platform. These actions support both fundamental research and its applications.

Mission confiée

One of the QAT team's objectives is to develop robust software environments that advance its research themes while disseminating these tools broadly within the quantum community, especially through the HQI initiative.

The primary role of the software engineer will be to leverage their expertise in software development and knowledge of quantum technologies to contribute to these projects.

More specifically, the hired engineer will:

- Participate in ongoing projects.
- Propose, create, and structure robust, reusable libraries for new projects of high scientific interest to the team and the broader community.

Principales activités

The engineer will engage in development and experimentation activities within the QAT team in close collaboration with Inria researchers. This includes:

- Developing and experimenting with quantum simulation platforms (mockups, specifications, design, coding, and testing) and eventually quantum computers, while preparing developer and user documentation.
- Proposing modular architectures and sustainable abstractions that enable the reuse of developments across diverse experimental platforms that will evolve over time.
- Building the foundations of a software environment that facilitates reproducible research, including creating datasets for publication and reuse, as well as distributing software components that are shareable, evaluable, and reusable by third parties.
- Conducting code profiling to identify and implement optimizations for improved performance.

Compétences

Education and Experience:

- Engineering degree in computer science with training in quantum technologies, or Master's/PhD in a related field with software development experience.
- At least 2 years of experience with an engineering degree or Master's.

Essential Skills:

- Proficiency in Python.
- Basic knowledge of quantum mechanics.
- Familiarity with the software development lifecycle, tools, and methodologies.
- Expertise in version control systems (especially Git), automated documentation tools, automated testing, and continuous integration.
- Strong technical and scientific English, both written and spoken.
- Autonomy, curiosity, and attention to detail.
- Strong writing skills.

Desirable Skills:

- Experience with collaborative software development.
- Knowledge/experience in an R&D environment (public or private).

Skills to Acquire During the Role:

- Proficiency with tools like Atos Qaptiva, Qiskit, NetSquid, and SquidASM.

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

Informations générales

- **Thème/Domaine :** Algorithmics, Computer Algebra and Cryptology
  Software engineering (BAP E)
- **Ville :** Paris
- **Centre Inria :** Centre Inria de Paris
- **Date de prise de fonction souhaitée :** 2025-10-01
- **Durée de contrat :** 12 months
- **Date limite pour postuler :** 2025-08-31

Contacts

- **Équipe Inria :** CASCADE
- **Recruteur :**
  Garnier Maxime / maxime.garnier@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'e?orce ainsi de répondre aux enjeux de la transformation numérique de la science, de la société et de l'économie.

L'essentiel pour réussir

- You are a computer engineer interested in quantum technologies or a recent graduate (Master’s or PhD) in a related field (e.g., computer science, physics) with software development experience.
- You are eager to contribute to ambitious projects within the institute.
- You are passionate about working in an innovative scientific and technological environment.
- You are skilled at collaborative work on scientific and technical/software projects.
- You are enthusiastic about learning new skills from others.
- You have excellent interpersonal skills.
- You possess fluent English skills, both written and spoken.

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