Quantum software engineer

Contract type	Fixed term contract
Length	12-24 months
Renewable	Yes
Qualification	Master or equivalent
Position	Scientific engineer
Date de prise de fonctions souhaitée	As soon as possible

Context

Inria (Institut national de recherche en informatique et automatique) is one of the major partners of the French National Quantum Strategy.

Together with Centre national de recherche scientifique (CNRS) and Commissariat à l'énergie atomique et aux énergies alternatives (CEA), Inria supervises several national funding schemes, namely the national Quantum research and infrastructure program(Programme et équipements prioritaires de recherche - PEPR) or the hybrid HPC-Quantum platform "Hybrid Quantum Initiative" (HQI). Via these actions, Inria supports both fundamental research and its applications.

Each Inria centre has a Service d'Expérimentation et de Développement (SED) *i.e.* a pool of scientific software engineers who together with the research scientists contribute to the development and real-life testing of several projects.

Missions

Under direct supervision of the QAT team lead, the appointed engineer will work with Inria's quantum researchers to bring their expertise on sofware development : testing, development cycle, packaging, stable interfaces for long-lasting code in a context of rapidly changing underlying libraries.
The engineer will also be involved with the SED to share their knowledge as well as participate in common tasks.

Main activities

The engineer will work on development projects within the QAT team and in close collaboration with Inria researchers outside QAT. They will be part of the SED network.
They will :

- participate in the developments and experiments (prototyping, specifications, conception, coding and test) with the research team on simulation engines in the short term and on real hardware in a longer term. Write documentation (for both developers and users) ;

- propose modular architectures and sustainable abstractions allowing to reuse the code for various time-evolving platforms ;

- build the foundations of a software environment allowing reproducible research by identifying reliable datasets that can be published and reused and by building reliable and sharable software components that can be assessed by others ;

Many scientific themes are addressed, among which : verification of quantum computation, noise-robustness and scaling of NISQ algorithms, error correction and fault tolerance, Hamiltonian learning, machine learning, compilation, …

Main characeristics

- You wish to help develop ambitious projects for the Institute
- You have a strong interest in scientific and technological work
- You are keen on learning new competences in contact with dynamic research teams
- You have good inter-personal communication skills
- Fluency in English (both spoken and written) mandatory

Having worked in proximity with academic research team would be a bonus.

Operational and personal skills

Education and experience

- Master level (university, engineering school), PhD

- Education in general computer science with a focus on software engineering

- Knowledge of the software development cycle, tools and methods

Required skills

- Python

- Versioning tools (git), automatic documentation generation tools, automatic testing and continuous integration.

- Good knowledge of both written and spoken technical and scientific English

- Independence and curiosity.

- Good writing skills.

Valued skills

- Linear algebra, unitary matrices, complex vectors.

- Experience in collaborative software development.

- Knowledge on parallelisation technique, high-performance computing : performance analysis, MPI/OpenMP, distributed memory – multithreading.

- Experience in an R&D environment (public or private).

First skills that will be acquired

- Atos Qaptiva, Qiskit, NetSQUID, SquidASM frameworks for example

- Basic quantum mechanics knowledge for software.

Location

Ecole Normale Supérieure, 45 rue d'Ulm, 75005 Paris (metro 7 Place Monge / RER B Luxembourg)

Inria centre : Centre Inria de Paris

Travel to different Inria centers may be needed.

Compensation

Depending on the candidate's profile and experience.

Benefits

45 days of annual leave

Remote work possible

Restauration costs partially covered

Participation to health insurance

Additional training courses possible

Contacts

Equipe Inria : QAT

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