Offer #2020-02970

Post-Doctoral Research Visit F/M Developing quantum or quantum-inspired simulation algorithms based on quantum walks

Contract type : Fixed-term contract

Renewable contract : Yes

Level of qualifications required : PhD or equivalent

Fonction : Post-Doctoral Research Visit

Context

This position is opened in the framework of the Inria-Microsoft lab and the work will be in collaboration with Microsoft Research. The candidate will be selected jointly by Inria and Microsoft.

This is an academic research position and the main work will be carried out at Inria Paris. The candidate is however expected to take the opportunity to have extensive visits at Microsoft labs (Paris and US).

The inria-Microsoft partnership is regularly extended, and in this context the position would typically be extended too, or a new call would be opened.

Assignment

Le but de cette recherche est d'établir une connection entre l'étude d'algorithmes basés sur les marches quantiques aléatoires sur les graphes, et des applications en simulation quantique (chimie quantique, simulation MonteCarlo quantique).

Pour plus d'informations sur ce sujet:
Voir les travaux de Simon Apers (Quantum Walks) et de Matthias Troyer (simulation quantique).

Collaboration:
La personne recrutée travaillera avec Alain Sarlette chez Inria-QUANTIC, ainsi qu'éventuellement d'autres chercheurs intéressés dans les équipes d'Inria-Paris. Du côté de Microsoft Research, les contacts seront Vivien Londe et Matthias Troyer, entre autres. Une collaboration avec des experts en optimisation classique (Lehigh University) fait également partie des possibilités.

Encadrement/Gestion:
Cette collaboration lance un nouveau thème de recherche, à la frontière de l'expertise de l'équipe QUANTIC. Ainsi, le/la candidat(e) sera en grande partie responsable lui/elle-même de la gestion de ce projet de recherche. (La partie financière sera assurée par l'équipe, et la recherche éventuelle de financements supplémentaires sera fortement encadrée par l'équipe.)

Main activities

The main activities would include:

taking part in proposing concrete research directions within the research topic
carrying out this research on your own (no PhD student coaching involved, at the moment)
presenting the results (conferences, journals, internally to the groups)
participating in the activities and discussions of the research team (see topics on web page)
if intereseted, developing an integrated software solution (e.g. in qutip or in some of the software and compiler solutions that are emerging for quantum algorithms)

Skills

Technical skills and level required : quantum algorithms (PhD); general quantum mechanics (sufficient level to discuss with researchers in quantum control, quantum error correction, and quantum simulation applications)

Languages : English

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 (after 6 months of employment) 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

General Information

- **Theme/Domain :** Algorithmics, Computer Algebra and Cryptology
  Scientific computing (BAP E)
- **Town/city :** Paris
- **Inria Center :** Centre Inria de Paris
- **Starting date :** 2020-12-01
- **Duration of contract :** 6 months
- **Deadline to apply :** 2020-12-07

Contacts

- **Inria Team :** QUANTIC
- **Recruiter :**
  Sarlette Alain / alain.sarlette@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.

The keys to success

The ideal candidate will have a strong expertise on quantum algorithms. A particular quality would be the ability and taste to establish links between various research topics, identifying essential common points to translate results ad methods. Another essential ability would be to carry out research in a rather autonomous way.

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.