



Job vacancy #2023-05966

Software Engineer F/M (forward and inverse problems for diffusion MRI)

Contract type : Fixed-term contract

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 Inria Saclay-Île-de-France Research Centre was established in 2008. It has developed as part of the Saclay site in partnership with **Paris-Saclay University** and with the **Institut Polytechnique de Paris**.

The centre has [39 project teams](#), 27 of which operate jointly with Paris-Saclay University and the Institut Polytechnique de Paris; Its activities occupy over 600 people, scientists and research and innovation support staff, including 44 different nationalities.

Context

This is a one year software developer position in the area of forward and inverse methods for solving diffusion problems, located in the Idefix Team at Inria Saclay, within the Unité de Mathématiques Appliquées (UMA), ENSTA Paris, on the Ecole Polytechnique campus.

Assignment

SpinDoctor 1.0 is a stand-alone Matlab Toolbox that performs numerical simulations for diffusion magnetic resonance imaging. See <https://github.com/SpinDoctorMRI/SpinDoctor> and [Publications](#)

Since the publication of SpinDoctor 1.0, important new functionalities have been developed and we would like to incorporate them into SpinDoctor.

The person recruited is responsible for SpinDoctor code development and publication on GitHub and will take initiatives for code testing and optimization.

The tasks include :

Constructing realistic neuron geometries appropriate for simulations;

Laplace eigenfunctions and eigenvalues of tissue geometries will be computed and stored so that a large number of diffusion MRI experiments can be simulated much faster than with conventional methods;

Pre-compute and store the pair-wise moments of Laplace eigenfunctions for a large dataset of neurons and glia cells so users can directly compute the diffusion MRI signals without computing eigenfunctions;

Main activities

Main activities :

- Test and optimize SpinDoctor code;
- Publish SpinDoctor 2.0 on Github;
- Publish User Guide;
- Work with developers and users on new functionalities.

Skills

Technical skills and level required :

Ease with programming in Matlab, knowledge of Python. Experience with solving partial differential equations using finite elements, and familiarity with numerical solvers of ordinary differential equations and numerical linear algebra.

Languages : French or 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 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

Remuneration

Remuneration : in regards to professional experiences

General Information

- **Theme/Domain** : Numerical schemes and simulations
Scientific computing (BAP E)
- **Town/city** : Palaiseau
- **Inria Center** : [Centre Inria de Saclay](#)
- **Starting date** : 2023-12-01
- **Duration of contract** : 1 year
- **Deadline to apply** : 2023-12-31

Contacts

- **Inria Team** : [IDEFIX](#)
- **Recruiter** :
Li-schlittgen Jing-rebecca / jing-rebecca.li@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 candidate should have a Master's degree in Applied Mathematics or Computer Science, be detail-oriented, have a strong interest and some experience with the publication of scientific software, and has familiarity with Matlab, Python and software development.

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.