

2019-01732 - Post-Doctoral Research Visit F/M Image analysis for multicellular tissues

Contract type : Public service fixed-term contract
Renewable contract : Oui
Level of qualifications required : PhD or equivalent
Fonction : Post-Doctoral Research Visit

Context

INRIA has developed a strong expertise in mathematical modeling of biological systems with medical applications.

Working closely with clinicians from several renowned French and German hospitals and one of the best biology and toxicology institutes in Germany, the team Mamba at its INRIA collaborators have been working on the liver for many years, developing models of liver lesions and regeneration, including tissue lesions of the micro-architecture of the liver. They are currently involved in various projects, including the study of fibrosis and cirrhosis to help the development of clinical treatments, the development of a liver created by bioengineering and the study of hepatic intoxication due to paracetamol.

Recently, the activities are also extended to other diseases such as lymphoma of the central nervous system, where similar methodologies can be applied.

Assignment

The position will be under the main direction of D. Drasdo. The work is within a collaboration with Hôpital Paul Brousse & Kremlin-Bicêtre / INSERM, Hôpital Universitaire La Pitié Salpêtrière, Paris, Inst. Curie, and the INRIA team Monc / Bordeaux within two projects, one funded by ANR, the second by the Natl. Inst. of Cancer in France. This requires regular meetings with medical doctors.

The candidate should develop image analysis methods and pipelines to quantify image information of mainly images at the histological level. This concerns images of liver micro-architecture, in vitro systems and lymphomas of the central nervous system (PCNSL). The image information will subsequently be used to set up, parameterize, and validate mechanistic mathematical models. Hence, interest or/and skills in modeling are welcome.

As we use to provide our partners also with image analysis software, we encourage the implementation of pipelines in TiQuant (Friebel et. al., Bioinformatics, 2015).

The recruited person should meet with clinicians and coordinate our image analysis activities with internal and external partners.

Main activities

- Image analysis of clinical histological images and images from non-invasive imaging modalities.
- Implementation into re-usable software, for example TiQuant. The latter permits direct use to biological and clinical partners and implementation of pipelines in clinical environments.
- Interaction and coordination of our groups' activities with our partners from Hôpital Universitaire La Pitié Salpêtrière, Paris, Inst. Curie, and the INRIA team Monc / Bordeaux.
- Reporting about our activities.

Skills

Technical skills and level required : image analysis, programming, ideally in C/C++ and matlab because of existing codes. Operating systems are linux, windows and MacOX.

Languages : English mandatory, French would be desirable.

Openness to other scientific cultures and working in an international team.

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

Remuneration

- Location: Paris 12^{ème}
- Gross Salary per month: according to experience

Security and defense procedure:

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

General Information

- **Theme/Domain :** Modeling and Control for Life Sciences
Scientific computing (BAP E)
- **Town/city :** Paris
- **Inria Center :** CRI de Paris
- **Starting date :** 2019-07-01
- **Duration of contract :** 2 years
- **Deadline to apply :** 2019-09-30

Contacts

- **Inria Team :** MAMBA
- **Recruiter :**
Drasdo Dirk / Dirk.Drasdo@inria.fr

About Inria

Inria, the French national research institute for the digital sciences, promotes scientific excellence and technology transfer to maximise its impact. It employs 2,400 people. Its 200 agile project teams, generally with academic partners, involve more than 3,000 scientists in meeting the challenges of computer science and mathematics, often at the interface of other disciplines. Inria works with many companies and has assisted in the creation of over 160 startups. It strives to meet the challenges of the digital transformation of science, society and the economy.

The keys to success

Background and knowledge in interdisciplinary research in relation to biology or/and medicine, image analysis in biological systems, and knowledge in programming is required. Ideally this is matlab, C++, Python ...

The candidate should be ready to work in an interdisciplinary team and communicate with biologists and medical doctors. Large level of independency would be welcome.

Moreover, knowledge in mathematical modeling of biological systems is appreciated.

The candidate will partially have to extend existing code in C++ or matlab.

English is compulsory, French would be of great advantage.

Instruction to apply

Defence Security :

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Recruitment Policy :

As part of its diversity policy, all Inria positions are accessible to people with disabilities.

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.

Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.