Job vacancy #2023-06837

Research Engineer - Deep learning for brain image analysis

Contract type: Fixed-term contract
Renewable contract: Yes
Level of qualifications required: Graduate degree or equivalent
Other valued qualifications: Master or PhD
Function: Temporary scientific engineer

Context

The ARAMIS Lab (www.aramislab.fr) at the Paris Brain Institute (https://institutducerveau-icm.org/en) develops advanced deep learning tools to solve unmet needs in neuroimaging. This is done within the framework of multidisciplinary projects conducted in collaboration with medical teams at the Paris Brain Institute. All developments are performed within the Open Source software platform [Thibeau-Sutre et al., 2022] which is developed by the ARAMIS Lab. ClinicaDL is an end-to-end framework to ease development of deep learning applications for neuroimaging data and to prevent common pitfalls that we identified and described in a previous study [Wen et al., 2020]. These pitfalls are the difficult use of neuroimaging data sets by users with little expertise, data leakage during training and testing, and insufficient reproducibility. ClinicaDL includes a set of tools to prepare data for deep learning tasks (such as quality check, label definition, generation of synthetic data), architecture search, network training, as well as result inference, model evaluation and interpretation. In addition, it implements a set of technical solutions to avoid the main methodological issues causing data leakage found in the literature. ClinicaDL allows its users to work with a great diversity of neuroimaging data sets as it interacts with a neuroimaging standard, the Brain Imaging Data Structure. This structure eases data processing by Clinica [Routier et al., 2021], the companion project of ClinicaDL.

ClinicaDL: https://github.com/aramis-lab/clinicadl | https://clinicadl.readthedocs.io
Clinica: https://github.com/aramis-lab/clinica | clinica.run

Assignment

We are looking for a Research Engineer that will both contribute to the development of the ClinicaDL platform, and train and validate deep learning models that can solve unmet needs for analysis of neuroimaging data and provide new biomarkers in various brain disorders (multiple sclerosis, Parkinson’s disease...) in collaboration with our medical partners.

Salary: depending on experience
Type of contract: fixed-term contract (duration to be discussed)
Starting date: as soon as possible

Main activities

You will be in charge of the:
- implementation of new architectures into the ClinicaDL software platform (in particular for image segmentation, image translation and image synthesis),
- training and validation of deep learning models using various neuroimaging modalities and datasets provided by our medical partners,
- interpretation of results and contribution to scientific publications,
- interaction with medical partners.

You will also be involved in the:
- software maintenance,
- user support and animation of the community,
- contribution to training and dissemination with the other engineers of the team.

In addition, you will be presenting the software at international scientific conferences and other events (organized for instance by Inria, ICM, CNRS).

**Skills**

- Strong programming skills in Python
- Solid knowledge of deep learning is mandatory
- Knowledge of digital image processing is mandatory and experience with medical imaging would be a strong plus
- Good understanding of the software development process and tools (Git, continuous integration, tests)
- Excellent relational and communication skills
- Good writing skills (documentation, website, scientific articles)

**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
- Flexible organization of working hours (after 12 months of employment)
- 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 based on profile and experience

**General Information**

- **Theme/Domain**: Computational Neuroscience and Medicine
- **Software engineering** (BAP E)
- **Town/city**: Paris
- **Inria Center**: Centre Inria de Paris
- **Starting date**: 2024-01-01
- **Duration of contract**: 3 years
- **Deadline to apply**: 2023-12-31

**Contacts**

- **Inria Team**: ARAMIS
- **Recruiter**: Colliot Olivier / Olivier.Colliot@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.
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.