2018-01071 - Software developer - Big data analysis of medical images

Contract type : Public service fixed-term contract
Renewable contract : Oui
Level of qualifications required : Graduate degree or equivalent
Function : Temporary scientific engineer

Context

The topic: machine learning from massive datasets of medical images

The ARAMIS lab develops automatic tools to assist clinicians in the diagnosis and prognosis of neurological diseases. These tools rely on advanced machine learning algorithms that are trained using datasets of patients. In particular, we develop machine learning approaches for brain imaging data such as magnetic resonance imaging (MRI). Very large datasets (containing tens of thousands of patients) are key for learning efficient models and for reliably assessing their performance. However, the use of such very large datasets raises numerous computational challenges.

A vibrant scientific, technological, clinical and ethical environment:

You will work within the ARAMIS lab (www.aramislab.fr) at the Brain and Spine Institute (http://www.icm-institute.org), one of the world top research institutes for neurosciences. The institute is ideally located at the heart of the Pitié-Salpêtrière hospital, downtown Paris.

The ARAMIS lab, which is also part of Inria (the national French research institution for computer science), is dedicated to the development of new computational approaches for analysis of large neuroimaging and clinical data sets.

You will be strongly involved in scientific aspects of the work, such as discussion of methodological issues and interpretation of results. You will interact locally with the PhD students, postdoctoral fellows and engineers of the ARAMIS lab, as well as our medical collaborators. You will take part in the communications and publications resulting from the use of the software.

We are conscious of ethical and fairness responsibilities of research in all aspects. Amongst others we have the support of Fondation Abeona (www.fondation-abeona.org), whose objective is to promote gender sensitive use of data science.

Assignment

Your mission:

You will be in charge of developing and applying software tools for processing massive medical imaging datasets. Such tools include: database management, conversion of the data to a standard format, feature extraction from MRI data, quality control, training and validation of machine learning algorithms. More precisely, you will be in charge of specific developments to adapt our software to the processing of big data and for its deployment on the distributed computing infrastructure of our partners. In link with the other members of the team, you will also be in charge of integrating the developed tools into the open source software platform Clinica (www.clinica.run) devoted to multimodal image analysis and developed by the team. Finally, you will deploy the tools on large databases of patients and contribute to the interpretation of results.

Main activities

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- Development in Python, using Hadoop and Spark technologies
- Data analysis using the developed code
- Writing documentation
- Assisting users and other members of the lab

Benefits package

- Subsidised catering service
- Partially-reimbursed public transport

General Information

- Theme/Domain: Computational Neuroscience and Medicine
- Software engineering (BAP E)
- Town/city: Paris
- Inria Center: CRI de Paris
- Starting date: 2018-11-01
- Duration of contract: 1 year, 6 months
- Deadline to apply: 2018-11-01

Contacts

- Inria Team: ARAMIS
- Recruiter: Colliot Olivier / olivier.colliot@inria.fr

About Inria

Inria, the French National Institute for computer science and applied mathematics, promotes “scientific excellence for technology transfer and society”. Graduates from the world’s top universities, Inria’s 2,100 employees rise to the challenges of digital sciences. With its open, agile model, Inria is able to explore original approaches with its partners in industry and academia and provide an efficient response to the multidisciplinary and application challenges of the digital transformation. Inria is the source of many innovations that add value and create jobs.

The keys to success

Your profile

- Engineer degree, Master or Bachelor in computer science or electrical engineering
- Strong programming skills in Python
- Knowledge of the following technologies would be a plus but is not mandatory: HDFS (Hadoop), Spark, SQL, Docker
- Knowledge of digital image processing and medical imaging would be a plus but is not mandatory
- Good relational and communication skills to interact with professionals from various backgrounds.

Conditions for application

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.

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.