

## JOB OFFER

### Research engineer Brain image analysis

**Keywords:** Python, neuroimaging, image analysis, medical imaging

**The topic: Clinica – Open-source software for brain image analysis**

The ARAMIS lab develops the open-source software Clinica [1] ([www.clinica.run](http://www.clinica.run), <https://github.com/aramis-lab/clinica>), an end-to-end solution for brain image analysis. Clinica allows users to easily analyze large-scale clinical studies with advanced computational tools. To that purpose, it integrates tools for data management, image preprocessing for different modalities (anatomical MRI, diffusion MRI, PET), feature extraction, machine learning and statistics. Clinica is distributed freely to the scientific community and has 400+ users worldwide. It has been used to produce high impact medical publications that have advanced the understanding of neurodegenerative diseases such as Alzheimer’s disease, fronto-temporal dementia and amyotrophic lateral sclerosis [2,3,4]. It is also widely used by researchers who apply machine learning to the diagnosis of brain diseases [5,6,7].

- [1] Routier A, Burgos N, Díaz M, ..., Habert M-O, Durrleman S, Colliot O: ‘Clinica: An Open Source Software Platform for Reproducible Clinical Neuroscience Studies’, **Frontiers in Neuroinformatics**, 15:39, 2021
- [2] Bertrand A, Wen J, Rinaldi D, ..., Durrleman S, Colliot O, Le Ber I: ‘Early cognitive, structural and microstructural changes in c9orf72 presymptomatic carriers before 40 years of age’, **JAMA Neurology**, 75(2):236-245, 2018
- [3] Routier A, Habert M-O, Bertrand A, ..., Dubois B, Colliot O, Teichmann M: ‘Structural, Microstructural, and Metabolic Alterations in Primary Progressive Aphasia Variants’. **Frontiers in Neurology**, 9:766, 2018
- [4] Koval I, Bône A, Louis M, ..., Colliot O, Allassonnière S, Durrleman S: ‘AD Course Map Charts Alzheimer’s Disease Progression’. **Scientific Reports**, 11(1): 8020, 2021.
- [5] Samper-González J, Burgos N, Bottani S, ..., Durrleman S, Evgeniou T, Colliot O: ‘Reproducible evaluation of classification methods in Alzheimer’s disease: Framework and application to MRI and PET data’. **NeuroImage**, 183:504–21,2018.
- [6] Wen J, Thibeau-Sutre E, Diaz-Melo M, ..., Durrleman S, Burgos N, Colliot O: ‘Convolutional Neural Networks for Classification of Alzheimer’s Disease: Overview and Reproducible Evaluation’. **Medical Image Analysis**, 63: 101694, 2020
- [7] Chadebec C, Thibeau-Sutre E, Burgos N, Allassonnière S: ‘Data Augmentation in High Dimensional Low Sample Size Setting Using a Geometry-Based Variational Autoencoder’. **IEEE Transactions on Pattern Analysis and Machine Intelligence**, 1–18, 2022

#### Your mission

You will be in charge of the:

- development of new features (manual and automatic quality control of processed images, image processing pipelines, data converters, visualization),
- software maintenance,
- user support and animation of the community.

In addition, you will be presenting the software at international scientific conferences and other events (organized for instance by Inria, ICM, CNRS...). Finally, you will contribute to ambitious medical studies, by deploying Clinica on large databases of patients, contributing to the interpretation of results and providing assistance to medical users (internal to the lab and external collaborators).

### **A vibrant scientific, technological, clinical and ethical environment**

You will work within the ARAMIS lab ([www.aramislab.fr](http://www.aramislab.fr)) at the Paris Brain Institute (<https://institutducleveau-icm.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 French National Institute for Research in Digital Science and Technology), is dedicated to the development of new computational approaches for the 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.

### **Your profile**

- PhD degree or master + experience in the field of medical imaging
- Strong programming skills in Python
- Knowledge of digital image processing and medical imaging is mandatory
- Experience with neuroimaging data (and with neuroimage analysis tools, e.g. Nipype, Pydra, SPM, Freesurfer) would be a strong plus
- Experience working with Git/GitHub on open-source projects would be a plus
- Excellent relational and communication skills to interact with users and lab members
- Good writing skills (documentation, website, scientific articles)

**Salary:** depending on experience (annual gross salary between 33500 € and 36000 €)

**Type of contract:** fixed-term contract (18 months, renewable)

**Starting date:** from March 2024

### **Ready to take up the challenge?**

Send your CV to [nicolas.gensollen@inria.fr](mailto:nicolas.gensollen@inria.fr), [olivier.colliot@cnrs.fr](mailto:olivier.colliot@cnrs.fr) and [ninon.burgos@cnrs.fr](mailto:ninon.burgos@cnrs.fr)