



## ARAMIS Lab (Paris, France) recruits a Software Developer for Scientific Computing and High Performance Computing in Medical Imaging

**Keywords:** software engineering, C++, medical imaging, 3d computer graphics, optimization, high performance computing, parallelization

The ARAMIS lab recruits a **high-profile software developer** with a solid background in scientific computing, software engineering, and high performance computing.

**The topic:** The ARAMIS lab develops **computer-aided tools** for the diagnosis, prognosis and monitoring of neurological diseases. We use physical based models together with machine learning tools informed by **medical images and geometric features** extracted from these images like sets of curves or surface meshes. The **software Deformetrica**<sup>1</sup> synthesizes the successive innovations that the lab has made on this topic over the years. As such, the software plays a pivotal role in the activity of our research lab in that it allows the routine use of our new methodologies in clinical studies, and supports the development of the innovations of the next generation.

Publicly available, the software is used by a community of developers and researchers worldwide. The software has been downloaded more than 250 times, it is freely accessible on the ICM GitLab repository<sup>2</sup> with continuous integration. It is essentially developed by a core team of 5 active people. It is written in C++2011 with more than 23k lines of code with dependencies with ITK, VTK and BLAS/Lapack via Armadillo. Core modules are implemented in CUDA.

**Your mission** is to extend the adoption and usage of the software by enabling more demanding applications. To this end, we will be in charge of:

- **increasing software performance** by re-designing software architecture, optimizing parts of the algorithms, linking to more efficient libraries (e.g. TensorFlow), implementing parallelization schemes for computer cluster and GPU computing based on regular profiling reports and benchmarks,
- **deploying the software** on various architectures from local multi-core workstations to computer cluster and GP-GPU servers,
- **coordinating software development** within the research lab, notably by teaching good practices in software development to PhD students,
- **communicating about the software** by attending international workshops, developing the website, creating more tutorials and documentation,
- **assisting the user and developer community** by administering the GitLab repository, addressing issues, answering questions in the Google group or in emails,

<sup>1</sup>[www.deformetrica.org](http://www.deformetrica.org)

<sup>2</sup><https://gitlab.icm-institute.org/aramislab/deformetrica/>

### ARAMIS Team

Brain and Spine Institute (ICM)  
CNRS UMR 7225 – Inserm U1127 – University Pierre and Marie Curie UM 75  
Inria Paris-Rocquencourt Center  
<http://www.aramislab.fr>



**Your profile:** You are motivated by working at the interface between **mathematics, computer science**, and by the **transfer** of the output of front-end research to the clinics and the industry. You are problem solver and result-oriented. You have good relational and communication skills with scientists from various disciplines.

You have worked on the development of a software product designed in a research environment. You master the C++ programming environment, and scientific computing. You have a proven experience in high performance computing and software design. Experience with medical imaging oriented library such as VTK, ITK, and/or TensorFlow would be a plus.

**The team:** The **ARAMIS lab** is ideally located at the **Brain and Spine Institute (ICM)**, one of the major research institute for neurosciences in Europe, which located at the heart of the Pit -Salp tri re hospital, downtown Paris. The lab gathers researchers with background in applied mathematics and computer science, research engineers and clinical experts in the field of neurodegenerative diseases. The lab is also part of **INRIA**, the French national research institution for computer science.

**Starting date:** from December 2017.

**Contract duration:** from 2 to 4 years.

**Salary:** depending on experience.

**For more information and to apply:** contact [Stanley.Durrleman@inria.fr](mailto:Stanley.Durrleman@inria.fr) and [benjamin.charlier@umontpellier.fr](mailto:benjamin.charlier@umontpellier.fr)

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ARAMIS lab web page: [www.aramislab.fr](http://www.aramislab.fr)

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