

Job Offer

Post-doctoral position on Intra-Cranial Aneurysm Detection and vasculature Characterization via Deep Learning.

Job Profile

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Offer description

The post-doctoral fellow will join the research team I at l'institut du thorax research lab - ITX in Nantes, France, under the supervision of Florent Autrusseau (<http://www.polytech.univ-nantes.fr/autrusseau-f/>). The ITX (INSERM, CNRS & Nantes University) is a public expert center devoted to patient care, translational research and training in cardiovascular, respiratory and metabolic diseases.

The laboratory supports strong teamwork as well as individual career development.

In the context of a wide national project, involving various partners, such as the University Hospital in Nantes (neuro-radiology department) and the *l'institut du thorax* (ITX, INSERM UMR 1087), the Universities of Grenoble, Rennes, and Bordeaux, but also several companies (General Electric Healthcare, Sim&Cure, Milvue, Medtronic) we are interested in exploring/characterizing the brain vascular tree, and more precisely, to characterize the brain arteries, classify the major cerebral bifurcations and automatically detect intracranial aneurysms using deep learning approaches. Effectively, in order to prevent cerebrovascular accidents, it is important to study the blood flow at the major bifurcations along the cerebral vascular tree (we mostly focus on the major arteries forming the Circle of Willis).

We are thus looking for a young researcher (Ph.D degree required), who may be interested in pursuing a postdoctoral internship (one year position with a possible extension) on medical Imaging and Artificial Intelligence.

Researcher profiles

- ☐ First-Stage Researcher (*PhD candidate*)
- ☒ Recognized Researcher (*with less than 4 years research experience after PhD*)
- ☒ Established Researcher (*with more than 4 years research experience*)
- ☐ Leading Researcher

Research Fields (2 max.)

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|--|---|
| ☐ Biological Sciences | ☐ Medical Sciences |
| ☐ Chemistry | ☐ Neurosciences |
| ☒ Computer Science | ☐ Pharmacological Sciences |
| ☐ Engineering | ☐ Physics |
| ☐ Environmental Science | ☐ Technology |
| ☐ Ethics in Health Sciences | ☐ Other (specify): |

Main Activities

- Propose methods for intracranial aneurysms detection and vascular tree characterization (based on Deep Learning approaches).
- In the framework of this project, we will collect thousands of segmented MRA-TOF as well as 3DRA and CTA acquisitions, from more than 60 French University hospitals. The post-doc fellow will be expected to conduct a thorough study on aneurysm detection and vasculature characterization (of both arteries and aneurysm sacs).

- The post-doc fellow will be expected to work on 3D mesh representations of the vascular trees (and hence propose modality agnostic detection/characterization methods).
- A full synthetic model of the vasculature will be exploited to train the neural networks (see : "Building a Synthetic Vascular Model: Evaluation in an Intracranial Aneurysms Detection Scenario" in IEEE-TMI 2024, and patent "*Method for Recognizing Bifurcations in a Vascular Tree, Associated Methods and Devices*").
- Bring various improvements on the synthetic model (vasculature shape / aneurysm / background noise modelling)
- Numerical simulations will be performed on a GPU HPC cluster.
- Programming in Python, C/C++.

Associated Activities

- Possible co-supervision of Master's and/or PhD's students (on a similar topic).

Specific Requirements or Constraints

- Various trips in France and/or abroad.

Skills/Qualifications

- Must hold a Ph.D. degree in Mathematics / Computer science or Machine Learning.
- Be able to work within a multidisciplinary project.
- Be autonomous, but yet, have the ability to work in a team.
- Good writing skills (progress reports, scientific articles).
- Scientific rigor.
- Be fluent in English, master technical and scientific notions.
- Strong programming skills (Python, C/C++) /Expertise with python Deep Learning Frameworks (Keras, TensorFlow or PyTorch)

Required Experience

☒ 0 to 2 years ☒ 2 to 4 years ☐ 4 to 10 years ☐ >10 years

Fields: Computer science, medical imaging, deep learning, image analysis.

Required Education Level or Diploma

- Ph.D. degree in computer science.

Required Languages

- English (French is a plus)

Hosting Unit

Code

UMR 1087

Name

The research unit of l'institut du thorax

Director

Richard REDON

Composition

200 people

Address

8, Quai Moncousu 44000 Nantes

Website

<https://umr1087.univ-nantes.fr/>

Contract

Type	Fixed term contract
Duration	13 months (with possible extensions)
Salary	Upon experience and according to INSERM salary standards
Envisaged Start Date	February 1 st 2026

Application

Applicants must send a CV and a cover letter to:

Florent Autrusseau (Florent.Autrusseau@univ-nantes.fr)

Contact for further information (name, telephone/mail):

E-mail: Florent.Autrusseau@univ-nantes.fr

Telephone: +33 240683156

Deadline for application:

Dec. 15th 2025