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Job Offer

Post-doctoral position on the development of a generic 3D mesh intracranial aneurysms detection method using deep learning and synthetic vascular models.

Job Profile

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Offer description	The post-doctoral fellow will join the research team I at l'institut du thorax - ITX in Nantes, France, under the supervision of Florent Autrusseau (http://www.polytech.univ-nantes.fr/autrusseau-f/) and Laurence Rouet (Siemens Healthineers). 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 research project, we aim to propose an automatic aneurysm detection operating on 3D meshes. 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. During this post-doc, 3D meshes representations of various acquisitions modalities (MRA-TOF, CTA, 3DRA) will be used. We will mostly focus on the major arteries and bifurcations forming the Circle of Willis. Within the University of Nantes, 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	☐ Recognized Researcher (*with less than 4 years research experience after PhD)*
Research Fields (2 max.)	☐ Computer Science
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) on 3D meshes. • 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 (vascular tree /aneurysm shape)

	• Numerical simulations will be performed on a GPU HPC cluster. • Programming in Python, C/C++ is a plus.
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, 3D meshes, 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	195 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	2.000 to 2.400 €/month (net) depending on qualifications.
Envisaged Start Date	June 1st 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:

March. 31st 2026