Postdoctoral researcher in Automatization of the 3D reconstruction of the diaphragm, rib cage and cephalometry from biplanar X-rays

General information:
This project is under the responsibility of: UMRS 1158 Sorbonne Université, Inserm – Respiratory Neurophysiology – Pitié-Salpêtrière Hospital and is being conducted in collaboration with the Institut de Biomécanique Humaine Georges Charpak (IBHGC, Arts et Métiers, Université Sorbonne Paris Nord).

Workplaces: UMRS 1158 – Respiratory Neurophysiology – Pitié-Salpêtrière Hospital, Paris and Institut de Biomécanique Humaine Georges Charpak (IBHGC, Arts et Métiers, Université Sorbonne Paris Nord), Paris
Mentors: Dr Valérie Attali, MD, PhD, HDR (UMRS 1158); Dr Damien Bachasson, PhD, HDR (UMRS 1158).
In collaboration with Dr Laurent Gajny, PhD, HDR (IBHGC), Dr Claudio Vergari, PhD, HDR (IBHGC), Dr Baptiste Sandoz, PhD, HDR (IBHGC).

Type of contract: Appointment by Sorbonne University. Full time.
Contract period: 12 months.
Start period: nov-dec 2025
Salary: Competitive salary in accordance with Sorbonne University guidelines.

About the Role:
This postdoctoral project aims to automate three-dimensional geometric modeling of the diaphragm, rib cage, and the computation of facial dimensions from biplanar X-rays in a standing position in COPD patients in order to accurately assess postural function.

This work will thus contribute directly to the generation of subject-specific models, their geometric validation, and the extraction of parameters describing interindividual and pathological variations. These data will feed into the next stages of the project to identify clinically relevant biomarkers of postural dysfunction in COPD.

As a Postdoctoral Researcher, you will:

- automatically detect anatomical landmarks and segment anatomical structures on the radiographs using artificial intelligence.
- Fit and deform generic models of the ribs and the diaphragm on the radiographs. (standing X-rays at different lung volumes),
- Publish research findings in peer-reviewed journals and present at national and international conferences.

We Offer:

- A dynamic, interdisciplinary environment at the forefront of research in physiology, biomechanics, personalized models in humans.
- Integration into an excellent scientific environment.
- Support for professional development, including conference presentations and publications in high-impact journals.

Requirements

- PhD in biomedical engineering, physics, computer science, electrical engineering, or a related field.
- Proficiency in programming languages such as Python or C/C++
- Experience in signal processing (e.g., real-time filtering, segmentation), computer vision, or AI frameworks (e.g., PyTorch, TensorFlow).

- Solid programming skills, particularly in image analysis and deep learning are expected.
- Solid mathematical skills, particularly in geometry and numerical analysis, are also expected.
- A good level in mechanics, or even biomechanics, would be a plus.
- Operational know-how
- Adopt a quality approach to programming

Personal Attributes:

- Strong analytical and problem-solving skills.
- Team-oriented mindset with the ability to work collaboratively across disciplines.
- Initiative and autonomy in managing projects and meeting deadlines.
- A focus on practical, user-centered solutions that translate effectively into real-world applications.

Application Process:

To apply, send a CV and cover letter to Valerie Attali (valerie.attali@aphp.fr) and Damien Bachasson (damien.bachasson@inserm.fr)

Deadline: October 15, 2025. Applications will be reviewed on a rolling basis, so early submissions are encouraged.