

Job profile

POST-DOCTORAL POSITION
**MECHANICAL PROPERTIES AND MUSCLE-TENDON BEHAVIOUR OF THE LOWER LIMB
MUSCLES DURING CYCLING AND ROWING**

INSTITUT DE BIOMECHANIQUE HUMAINE GEORGES CHARPAK – ARTS ET METIERS INSTITUTE OF TECHNOLOGY

A **18-month post-doctoral position** is available at the **Arts et Métiers Institute of Technology** in Paris under the supervision of Pr **Floren Colloud**.

THCPA²⁰²⁴ - objectives and overall project -

This postdoctoral position is part of the **THCPA²⁰²⁴ project** led by Christophe Clanet (Laboratoire Ladhyx, Ecole Polytechnique), supported by the National Research Agency program “Programme Prioritaire de Recherche Très Haute Performance Sportive” (Grant for research applied to very high performance in sports), within the framework of the Olympic/Paralympic Games that will take place in Paris in 2024. It is anticipated that the results of the project will have direct applications for performance optimisation in 2024.

THCPA²⁰²⁴ is a multi-disciplinary program (biomechanics, physiology, mechanics and physics) on high performance in track cycling and rowing that include 10 research units and 2 sports federations (cycling and rowing). The project THCPA²⁰²⁴ has thus three main axes: one dedicated to human power generation (WP1), one dedicated to friction (WP2) and a synthesis axis using a multidisciplinary approach dedicated to the human-machine coupling optimization (WP3).



Position and collaborations

THCPA²⁰²⁴ project is composed of 3 experimental work packages. The postdoctoral student selected for the current position will work within the WP1 led by **Sylvain Dorel** (Associate Professor at the University of Nantes, France) and **Pierre Samozino** (Associate Professor at the USMB, Chambéry, France). WP1 aims at **maximizing power output and maintaining it over time in cycling and rowing**. The tasks in which the postdoctoral student will be involved focus on:

- **Assessing athlete's individual power-velocity-endurance profiles** and relating them to performance;
- **Characterising biomechanical and physiological constraints during competitions;**
- **Exploring neuromuscular and physiological determinants** of the individual power-velocity-endurance profile. This includes the central and peripheral mechanisms that govern the capacity to maintain power production over time with fatigue.

Main Tasks required by the post-doctoral position

- Conceive and write research protocols and ethics committee authorization when warranted;
- Collect and analyse biomechanical and neuromuscular data, with contribution to detailed feedbacks to practitioners;
- Guarantee a follow-up link with sport federation staff members and athletes, which is key to this WP, as well as with other postdoctoral students involved in the project;
- Organize and run training courses for coaches and federation staff members;
- Create tools for transfer of practical knowledge to coaches;
- Write international paper and prepare/present congress materials;
- Move to the different training locations of the elite and sub elite cycling and rowing athletes involved in the project.

Expertise Knowledge - Skills

- Advanced skills in motion capture, force sensors, EMG and ultrasounds;
- Advanced skills in multibody dynamic modelling, musculoskeletal modelling, optimization and data analysis;
- Skills in scientific programming (Matlab, Python, C++, ...);
- Knowledge in training and sport high performance;
- Knowledge in isokinetics and fatigue will be a plus;
- Fluent in English (and eventually correct French), good communication and writing skills.
- Rigor, sense of initiative, autonomy and a taste for experimental work.

Position start

October 2021.

Contact for any questions:

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Send application:

Send your application with motivation letter and complete CV before the **XX September 2021** to : floren.colloud@ensam.eu

The project being confidential, a non-disclosure agreement will be signed by the candidates