

<b>Job title</b>	<b>Post-doctoral researcher in human motion modeling and simulation</b>
<b>Research laboratories</b>	<b>IRISSE (La Réunion) &amp; S2M (Montréal)</b>
<b>Location</b>	<b>Réunion Island (French overseas department)</b>
<b>Application deadline</b>	<b>January 15, 2024</b>
Supervisors:	Teddy Caderby & Mickael Begon
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Duration	24 months
<b>Desired start date</b>	March 2024
<b>Salary (net per month)</b>	about 2500€

### Background description

The IRISSE laboratory is looking for a post-doctoral researcher to work on motion capture and analysis, and the development of biomechanical models to study the effects of aging and functional electrical stimulation on the biomechanics of walking.

The successful candidate will join the e-WALKING project (<https://anr.fr/Project-ANR-22-CE19-0009>), funded by the French National Research Agency (ANR). This project aims to develop an assistance solution based on electrical muscle stimulation to improve walking performance in the elderly. This collaborative research project involves 4 research teams.

### Missions

As part of this project, you will contribute to the tasks inherent in two work packages (WP):

WP1 aims to characterize age-related changes in muscle contribution to walking. More specifically, you will

- Participate in the implementation of the experimental protocol (acquisition of kinematic, kinetic, electromyographic and energetic data during walking in young and elderly healthy individuals).
- Participate in biomechanical data processing (calculation of kinematics and 3D dynamics)
- Develop and validate a musculoskeletal model for estimating muscle forces during walking
- Carry out gait simulation studies (simulation of alterations in muscle activation during walking)
- Dissemination of results

WP2 aims to understand and optimize the effects of electrical muscle stimulation on walking. Your missions in this WP will be:

- Participate in implementing the experimental protocol (acquisition of kinematic, kinetic, electromyographic, and energy data)
- Process biomechanical data (calculation of kinematics and 3D dynamics)
- Carry out musculoskeletal modeling and predictive simulation studies of walking under conditions of functional electrical stimulation (development and validation of a musculoskeletal model incorporating the activation dynamics of functional electrical stimulation, generation of optimal electrical stimulation patterns).
- Dissemination of results

### Skills

- Extensive experience in human movement analysis
- Musculoskeletal modeling and optimal control skills
- Python / Matlab programming skills – GIT
- Fluency in French is an asset for experimental work and integration in the laboratories

**Location**

The post-doctorate will be carried out mainly at the IRISSE Laboratory, located on the university campus of Le Tampon on Reunion Island (French overseas department). As part of your work, you may be required to travel to Canada (Montreal) as part of the S2M team, and to mainland France to attend conferences.

Please complete the application form and upload your CV and letter of motivation using the following link: <https://forms.gle/fAYwhkJCYB274hr7>

Short-listed candidates will have exercises with Bioptim (<https://github.com/pyomeca/bioptim>) and PyScienceMode (<https://github.com/s2mLab/pyScienceMode>) followed by an interview.

The IRISSE laboratory is firmly committed to fostering Equity, Diversity, and Inclusion in its environment, and we strongly encourage applicants from diverse backgrounds to apply, ensuring that everyone receives an equal opportunity to thrive and contribute.