MuSkLE
PhD programme
Building, maintaining and repairing the functional locomotor system

Co-funded by the European Union

PhD Position 03 job vacancy

Reference:	**PP03**
Title:	**Development and validation of a sensorless system to assess accurately the shoulder proprioception in athletes and patients**
Hiring institution:	**Lyon1**
Location:	University Claude Bernard Lyon 1, Villeurbanne, France.
Start date:	As from 1st September 2027
Duration:	36 months
Application deadline:	15th January 2027

Job description

Objective:	Context: Proprioception is defined as *peripheral sensory input that contributes to joint stability, postural regulation, and motor control*, including the ability to appreciate and interpret joint motion and force generated with a joint, and understanding the joint positions in space. Deficits in proprioception have been reported in injured shoulder, and these deficits remain for eight months after shoulder surgery, demanding specific rehabilitation management. However, the current methods for assessing shoulder proprioception are often limited by poor reliability, high costs, or time-consuming procedures. Recent advances in deep learning approaches offer a promising opportunity to develop a reliable, easy-to-use and cost-effective method for assessing shoulder proprioception routinely. **The aim of the doctoral project is to develop and validate a sensorless method to assess accurately the shoulder proprioception for applications in sport and orthopaedics.** **The recruited doctoral fellow (DF03)** will develop a neural network to characterize the shoulder proprioception based on video acquisition and assess its construct validity by comparison to marker-based and /or wearable motion capture systems. DF03 will investigate the reliability and discriminant validity of the proprioception assessment in healthy athletes and patients presenting shoulder disorders (e.g., rotator cuff muscle tear). DF03 will finally assess the sport-specific adaptations and/or the effects of surgery on the shoulder proprioceptive abilities. This project requires a commitment to multi-disciplinarity as DF03 will interact with researchers in Sport Science, Biomechanics, Orthopaedics and Computer vision. DF03 will also participate in transferring the developed technology to usable tool allowing the shoulder proprioception to be assessed routinely. Joining our team offers the opportunity to work within an internationally recognized lab for shoulder biomechanics.
Collaborations and co-supervisions:	The PhD project will be co-supervised by Isabelle Rogowski and Yoann Blache, and implemented in collaboration with elite sport training centres, and shoulder orthopaedic department.
Supervisors:	Isabelle Rogowski - isabelle.rogowski@univ-lyon1.fr Yoann Blache - yoann.blache@univ-lyon1.fr
Place of work:	Laboratoire Inter-universitaire de Biologie de la Motricité (UR 7424) Université Lyon 1 - UFRSTAPS 27-29, bd du 11 novembre 1918 – 69622 VILLEURBANNE, FRANCE

Required degree	Master's degree or equivalent in Human biomechanics, or Sport Science
Skills/Experience:	- Demonstrated experience in conducting in vivo experimental protocols for assessment of human motion analysis. - Proficiency in programming for data analysis and numerical simulation using platforms like Python and MATLAB. - Strong aptitude for working across scientific disciplines including human biomechanics, sport science, orthopedics - Interest in transferring fundamental insights to applied fields such as sports and/or clinic - Basis of scientific French language will be appreciated
Keywords	Joint Position Sense; Joint Motion Sense; Shoulder instability; Rotator cuff tears; Shoulder perceived dysfunction, Markerless

Mandatory requirements

Eligibility:	The doctoral fellow: - should not have resided or carried out his/her main activity (work, study) in the country where he/she is being recruited, i.e., France, **for more than 12 months in the 3 years before the application call deadline,** unless this time was part of a compulsory national service or a procedure for obtaining refugee status under the Geneva Convention. - **must be in possession of a master's degree** at the date of the call deadline. Applicants who have completed their cursus but not yet been awarded the formal master's degree by that date will not be considered eligible. - must be **a doctoral candidate** (not already in possession of a doctoral degree at the date of the application call deadline).
Languages:	Oral and written skills must meet the standards of academic English used in international research.

Job details

Type of contract:	Full time position
Gross salary:	The monthly **living allowance, including employer and employees' social charges, is €3,500.** This amount corresponds to a gross monthly salary estimated to €2,440 and to an estimated net monthly salary before income tax of approximately €1,976. On top of the monthly salary, the doctoral fellow will receive a **mobility allowance,** including employer and employees' social charges of €4,752 over the 36 months of the working contract. This amount corresponds to a gross monthly allowance estimated to €92 and to an estimated net monthly allowance before income tax of approximately €74.
Other benefits:	**Social Protection**: The fellow will benefit from **full social security coverage**, including health insurance, unemployment insurance, and pension contributions. He/she will also have access to occupational health services (*médecine du travail*), as required by French labour law. **Additional Insurance**: The fellow may choose to subscribe to complementary health insurance plans, at affordable rates (approximately €70 *per* month), of which 50% is paid by the employer. **Paid Leave**: The fellow is entitled to up to **33.5 days of paid leave annually** (for 35 hours worked per week), in accordance with national labour law, and will enjoy the same employment rights as other public-sector employees. **Transport**: The fellow benefits from significantly **reduced fares on public transport**, available in all partner cities. Additionally, the host institution will cover 50% of the monthly transportation costs. **Sports and culture:** The fellow will enjoy the cultural environment provided by the Lyon 1 campuses, where numerous exhibitions and activities open to the general public are organised throughout the year. The fellow may play his/her favourite sport in the largest University Sports Association in France, where over 30 activities are on offer year-round through the Sports & Physical Activity University Department. The fellow may also join one of the 70 student associations that unite the University.