

## INTERNSHIP OFFER - MASTER



### Biomechanical analysis and study of the effects of mindfulness meditation on the gesture and performance of drummers



**Location:** Institute of Movement Sciences EJ Marey (ISM), Luminy campus, Marseille, France.

**Duration:** 4 to 5 months.

**Supervisors:** Benjamin GOISLARD DE MONSABERT (assistant professor in Biomechanics)

Rita SLEIMEN-MALKOUN (assistant professor in Neurosciences)

**Contact:** [benjamin.goislard-de-monsabert@univ-amu.fr](mailto:benjamin.goislard-de-monsabert@univ-amu.fr); [rita.sleimen-malkoun@univ-amu.fr](mailto:rita.sleimen-malkoun@univ-amu.fr)

#### Background

More than 75% of drummers suffer from musculoskeletal disorders (MSDs) in their wrists or hands [1]. Nevertheless, few prevention guidelines exist. Moreover, a limited number of studies have addressed the mechanical constraints on the musculoskeletal system of the forearm and hand during drum practice, as well as their link with the underlying inter-limb and muscular coordination [2,3]. A recent study demonstrated the benefits of mindfulness meditation (MM) on the performance of complex movements, but its benefits in musicians have so far been scarcely investigated [4].

The proposed internship is part of an interdisciplinary project aimed at studying the contribution of MM in drummers by analyzing its influence on inter-limb and muscular coordination. The expected results will allow introducing MM as a means of preventing MSDs in drummers and more broadly in all domains involving intense control of movement.

The role of the trainee will be to develop and implement the experimental protocol allowing the multilevel evaluation of the effect of MM on the drummer's gesture through mainly the recording and analysis of electromyographic and kinematic activity, as well as psycho-cognitive tests.

**Keywords:** Biomechanics; Muscular activations; Motor control; Musical gesture, Mindfulness meditation; Musculoskeletal disorders.

#### Mission

- Conduct a bibliography review on the links between MM, muscle coordination and musical gesture.
- Develop a biomechanical analysis protocol of the drummer's gesture to study the effect of MM.
- Record and process kinematic and electromyography data.

#### Qualifications

- Degree or training in movement or sports sciences, computer science, signal processing, mechanics or biomechanics, or biomedical engineering.
- Interest in the analysis of human movement and musical gesture.
- Experience with motion capture systems (electromyography and/or kinematics).
- Experience with time series processing and analysis.
- The practice of a musical activity will be highly appreciated.

**Application:** Candidates must send by email to both supervisors a CV and a short cover letter demonstrating their interest and suitability for the internship.

#### References

- [1] Azar, 2020 Med Probl Perform Art. doi:10.21091/mppa.2020.3020.
- [2] Fujii et al., 2009 Neurosci Lett. doi:10.1016/j.neulet.2009.04.055.
- [3] Beveridge et al., 2020 Front Psychol. doi:10.3389/fpsyg.2020.01360.
- [4] Sleimen-Malkoun, Devillers-Réolon, Temprado, 2023 Front Psychol. doi:10.3389/fpsyg.2023.1162390