**Title**  
Comparison of wavelet mapping for vibration signal analysis in sport

**Supervisor-s**  
Surname: ROGOWSKI  
First Name: Isabelle  
Email: isabelle.rogowski@univ-lyon1.fr  
Phone: +33 4 72 43 28 48

**Institute**  
University Claude Bernard Lyon 1.

**Lab**  
Inter-University Laboratory of Human Movement Biology (EA 7424)

**Context**  
The Inter-University Laboratory of Human Movement Biology is a multi-disciplinary Lab gathering Neurosciences, Physiology and Biomechanics. The internship will take place in the ALP$^3$ team (Biomechanics), whom the main purpose is the assessment of joint overuses in human.

**Abstract/Objectives**  
Several methods can be used to study a vibration signal in the frequency domain. Among them, wavelet transforms enable the analysis in the time-frequency domain and are usually represented by a 3D mapping. Our team use wavelet transform to assess the transmission of the vibrations to the human body in tennis (player/racket interaction) and in running (ground/shoes/runner interaction).

The purpose of this internship will be to adapt a toolbox used in neuroscience to the field of biomechanics in order to perform comparison of several wavelet mappings. Thereafter, this new tool will be used by the internship to evaluate the effect of tennis racket and/or running shoes characteristics on vibration transmissions to the human body.
### Skills required
- Signal processing
- Matlab programming
- Basics in statistics
- Sports Sciences (Biomechanics) or Engineering
- Critical thinking and take initiative

### Bibliography


### Location
LIBM, Bâtiment R. Dubois, Université Lyon 1, 27-29 bd du 11 Novembre 1918, 69622 Villeurbanne Cedex

### Duration
3 months (May – July)

### Language (French/English/Both)
English and/or French