The Berlin School of Movement Science (BSMS), graduate school of the Humboldt-Universität zu Berlin, is offering a

PhD position with focus on the development and evaluation of a novel rehabilitation intervention in the presence of neural noise for chronic non-specific low back patients

for a period of 3 (4) years hosted at the Department of Training and Movement Sciences of the same university.

Project description

The purpose of the research project is to develop a specific and novel rehabilitation therapy based on a random/irregular functional perturbation training induced by disturbances on the spine that are unpredictable and continuously variable in amplitude and frequency and to apply this therapy in a homogeneous group of chronic non-specific low back pain patients that show neuromuscular control deficits in spine stability.

The modular organisation of muscle activation and the local dynamic trunk stability, which will be the main focus of this project, will be applied for the development and evaluation of the novel intervention. To investigate how the central nervous system organizes and uses specific muscle activation patterns (the so-called muscle synergies) to stabilize the spine, the electromyographic activity of several superficial trunk muscles will be measured and using a non-negative matrix factorization algorithm the muscle synergies will be extracted. The application of the variable and unpredictable disturbances will be realized using a specific device in the anteroposterior and mediolateral axes of the trunk. The amplitude and frequency changes of the disturbances will be controlled electronically.

We are looking for a PhD candidate interested in investigating the neurophysiological aspects underlying human motor control during trunk stabilization in the presence of neural-noise.

Qualifications

- Candidates should hold an MSc or equivalent in Clinical Biomechanics, Biomedical Engineering or Sport Science

- A very good mathematics and physics background, together with direct experience in signal processing are required. Previous work revolving around the concept of muscle synergies will constitute an important reason for preference.
- Strong experience in the use of high-level programming languages such as R, MATLAB, C or C++.
- Very good knowledge of the English language in speaking and writing is required.

Eligibility

- With the beginning of the scholarship the Master or equivalent studies must be completed.
- The latest degree may not date back longer than 6 years.
- At the time of the nomination the candidate may not be in Germany for more than 15 months.
- During the scholarship period, staying abroad is limited to 9 months in total and no longer than 3 months per year.

The position is funded with a DAAD scholarship (Graduate School Scholarship Programme) and it includes:

- Monthly scholarship of 1000.00 €.
- Health, accident and liability insurance.
- Funding of a German language course (2, 4 or 6 months).

Application procedure

The application can only be submitted electronically. It should be written in English and must contain the following:

- Letter of motivation
- Detailed curriculum vitae
- Letter of recommendation by two university professors from the home university, issued during the last 2 years (see the DAAD form attached)
- Copies of certificates or copies of translated documents:
    - Copy of the school leaving certificate qualifying for admission to higher education in your own country
    - Copies of certificates of annual examinations taken at the home university (transcripts of records)
    - Copies of certificates of any academic degrees or advanced qualifications showing grades and explain the home's grading system

- Certificates of internships (when available)
- The master thesis (or equivalent) and any publications or manuscripts

Contact information for this position

Students' representative of the Berlin School of Movement Science
Alessandro Santuz (alessandro.santuz (at) hu-berlin.de, +49 (0) 30 2093 46253)

We invite you to apply before the **15 November 2016**. Applications must be submitted as one pdf file containing all materials to be given consideration. Please send your application document via email to: w.hampel (at) hu-berlin.de.

The Department of Training and Movement Sciences at the Humboldt-Universität zu Berlin provides basic and applied research in the areas of training and movement sciences as well as biomechanics. Our main research fields include adaptation mechanisms of mechanical and morphological properties of muscles and tendons, plasticity of movement control and interaction between the neuronal and musculoskeletal systems in order to increase human performance and improve life quality. The successful candidate will work under the supervision of Prof. Dr. Adamantios Arampatzis (https://www.spowi.hu-berlin.de/en/institut-en/tbw-en/mitglieder-en/arampatzis-en?set_language=en).