

**Full-time PhD scholarship for research in the  
analysis of human movement and physiological data acquired during  
daily-life activities using a novel wearable sensor-based system**  
(University of Liège, Belgium)

**When?** The earliest starting date is October 1<sup>st</sup>, 2021.

**Where?** A full-time PhD position is available at the Laboratory of Human Motion Analysis (LAMH, <http://labos.ulg.ac.be/lamh>) of the University of Liège (ULiège) within the ARC-2021 project: “System for recording and analysis of Movement and Physiological data in daily-life Activities (SyMPA)”. The LAMH is an interdisciplinary platform focusing on the analysis of various human motions. Built in 2011 as a joint initiative of two faculties of ULiège, the Faculty of Applied Sciences and the Faculty of Medicine, the LAMH is equipped with advanced measurement systems such as a 3D motion capture system (4 Codamotion units), two force-plates (2 Kistler force-plates), and surface electromyography sensors (16-channel Delsys Trigno wireless sensors). Research projects are conducted in clinical science (e.g., gait analysis), sport science (e.g., 3D analysis of running and tennis serve, shoulder biomechanics), and engineering applications (e.g., human-robot cooperation, human-structure interaction). The LAMH team also contributes to the development of advanced motion analysis techniques such as low-cost technologies for ambulatory motion analysis, advanced signal processing methods for noise filtering and artefact compensation, as well as biomechanical modelling tools for inverse dynamics and predictive simulation.

**Project:** Funded by the Sector Council for Research and Development in Science and Technology of Uliège, the SyMPA project aims to develop a novel wearable sensor-based system - hardware and associated signal processing algorithms - to simultaneously record gait and physiological data during irregular real-life activities simulated in the LAMH. The proposed wearable sensor-based system will potentially provide a new scientific knowledge with respect to specific gait and physiological patterns, and will be beneficial for an early diagnosis of the PD to slow its progression, and for an accurate analysis about the effectiveness of treatments. The partners of the LAMH within this ARC-2021 project are (i) the Microsys Laboratory, Montefiore Institute ([www.microsys.uliege.be](http://www.microsys.uliege.be)), and (ii) the MoVeRe group at GIGA-CRC-in-vivo-imaging and CHU of Liège (<http://www.movere.ulg.ac.be>).

**PhD research:** The PhD candidate will conduct his research in close collaboration with the LAMH’s team and with all the partners. The research involves, among others,

- Rigorous design and implementation of setups simulating scenarios of everyday life,
- Experimental campaigns for acquiring movement and physiological data in groups of patients suffering from the Parkinson’s disease (PD) and healthy volunteers, during these real-life scenarios,
- Development of signal processing algorithms to robustly and accurately extract gait and physiological features of interest.

**Profile:** We are looking for a highly motivated, proactive, independent, critical, and strong team-player PhD candidate who obtained or will soon obtain a master degree (or equivalent) in one of the following fields: biomedical engineering, electromechanical engineering, electrical engineering, or mechanical engineering. The PhD candidate should have obtained excellent study results: an average degree of "distinction" during bachelor and master studies is required, as well as an excellent communication skills in English, both oral and written. He should have a strong interest or already have experience in research related to signal processing methods and to the human movement analysis (e.g., through the master thesis). The PhD candidate is able (i) to meet the PhD admission requirements of ULiège ([https://www.recherche.uliege.be/cms/c\\_11496930/en/doing-a-doctorate](https://www.recherche.uliege.be/cms/c_11496930/en/doing-a-doctorate)), and (ii) to strictly follow the instructions of ULiège in the context of processing collected personal data (<https://dox.ulg.ac.be/index.php/s/RaAOsv4lk4lBoYJ>). Experience with Matlab and active knowledge of French are assets.

**Offer:** We offer (i) a full-time doctoral scholarship for maximum four years with renewal every year, (ii) a PhD degree in Engineering if successful, and (iii) the opportunity to collaborate with the partners of the project and to participate in international conferences. This PhD research will be supervised by Prof. Olivier Brûls and by an experienced researcher in gait analysis from the LAMH, Dr. Ir. Mohamed Boutaayamou.

**Application:** Interested candidates are invited to send:

1. a motivation letter (max. 2 pages),
2. a detailed curriculum vitae,
3. a complete academic transcript to date and a publication record (if any),
4. an example of technical writing (paper or thesis),
5. the names and e-mail of at least two referees.

Applications should be sent to Prof. Olivier Brûls ([o.bruls@uliege.be](mailto:o.bruls@uliege.be)) and to Dr. Ir. Mohamed Boutaayamou ([mboutaayamou@uliege.be](mailto:mboutaayamou@uliege.be)), **before June 1<sup>st</sup>, 2021.**