

## Internship

### Perturbation-based balance training

Vitznau, 100%, 6 months (flexible), as soon as possible or starting in January 2024

The Lake Lucerne Institute is a non-profit research centre based in Vitznau. Its research group Rehabilitation Technology (ex-cereneo Foundation) with a research focus on developing and implementing technological solutions to improve neurorehabilitation outcomes. We work on digital, objective assessment solutions using a broad range of tools (fMRI, EEG, neurophysiology, movement analysis, robotics) and their implementation into clinical routine. The institute works closely with a neurorehabilitation centre to ensure true multi-stakeholder integration within each research project.

To support our ongoing research projects, we are looking for a Master student or Intern with enthusiasm for human movement data collection and analysis, data mining, and machine learning approaches. We are passionate about bringing innovation to the field in neurorehabilitation, and you should equally bring a strong drive to work on real-world projects that have a direct impact on patients' rehabilitation experience.

### Project Background

Are you interested in improving the health and safety of older adults? Join our team in exploring perturbation-based balance training as a fall prevention strategy in the elderly.



Striving for a healthier and safer aging experience, we're tackling the concerning statistics of 37 million fall injuries and 684'000 deaths from falling each year. Our focus is on preventive balance training, specifically "Perturbation-based balance training (PBT)". PBT mimics the accidental and unpredictable nature of slips and trips in daily life in a safe and controlled environment. PBT allows individuals to practice rapid and effective reactive gait adjustments as a fall prevention strategy and acts as a confidence booster for safe and stable ambulation.

The aim of this study is to evaluate the acute and midterm effects and the underlying mechanisms of a single training session in elderly people. With data collection completed, we are now ready to analyze a comprehensive dataset of 60 people including 3D-motion capture data, IMU-data and Virtual Reality motion data.

## Responsibilities

This master's project/internship includes the following tasks:

- Process and analyze 3D-motion capture data, IMU-data, and Virtual Reality motion data from a dataset of 60 participants.
- Assessment of the acute and medium-term effects of a single PBT session on dynamic balance and perturbation recovery in older and young adults
- Compile and summarize research data, ensuring that participants receive relevant information from our study

## Your Profile

- Coding skills in Python (the more you know the better)
- Experience analysing 3D movement data, VR-motion data and/or IMU-data is advantageous but not necessary
- Reliability and structured working
- Enthusiastic, friendly, and communicative approach to work
- Conceptual skills, independent working style

## We offer

- A unique and stimulating work environment combining world class neurorehabilitation practice with cutting edge research
- Exciting technology platforms, already ongoing clinical studies, and large datasets that will be made available
- Direct exposure and deep integration with a clinical research environment, incorporating a wide range of practitioners and patients
- On-site accommodation and free parking in Vitznau, modern working culture, and opportunities for working remotely

## Curios? So are we!

To apply please send a cover letter outlining your motivation and experience in the field, CV and a transcript of records to [saskia.neumann@llui.org](mailto:saskia.neumann@llui.org) and [aileen.naef@llui.org](mailto:aileen.naef@llui.org). Questions regarding the position should also be directed to these contacts.

Further information about our work can be found at: [www.llui.org](http://www.llui.org)