Therapy Science Lab
Ubiquous Adaptive Rehabilitation Pathways
LLUI

Master thesis

Validating posture algorithms in hospitalized patients

Vitznau and Lucerne, 80-100%, 6 months, starting February/March 2026

Lake Lucerne Institute is a non-profit research centre dedicated to developing and implementing technological solutions to improve rehabilitation outcomes. At the Therapy Science Lab, our work focuses on digital, sensor-based measurement methods and interventions and their integration into routine clinical practice. This project is conducted in close collaboration with Luzerner Kantonsspital as part of the Hospital in Motion initiative, as well as with activPAL, a developer of research-grade wearable sensors and algorithms.

We are seeking a highly motivated student interested in validating a posture classification algorithm in a real-world clinical environment. The project offers the opportunity to innovate and address a real-world challenge that directly impacts patient recovery.

Project Background

This project is part of the Hospital in Motion initiative, which aims to increase physical activity of hospitalized patients. Two activPAL accelerometers are used to quantify posture: the time spent sitting (reclined and upright, in and out of bed), standing, and walking. A novel proprietary algorithm will be validated, and a second, self-developed signal processing algorithm will be developed and assessed in parallel. By combining direct patient observations with sensor data, you will investigate how accurate these digital tools capture movement patterns in everyday clinical practice and identify how they could be further improved.

The project offers you direct insights into clinical research, close collaboration with healthcare professionals, and the opportunity to contribute to applied research at the interface of healthcare and technology. In addition to strengthening your management and research skills, you will gain valuable insights into how digital health solutions are developed, tested, and translated into practice. At the conclusion, the project shall be published in a scientific journal.

Project Tasks

- Reviewing the Literature (20%) – Familiarize with relevant research and analytical methods.
- Data Recording (20%) – Perform structured patient observations at the hospital.
- Processing and analysis (40%) – Process recorded data, run statistical analyses.
- Scientific Writing (20%) – Document the work for your thesis and a journal article.

Your Profile

- Strong motivation to tackle a real-world data challenge in a clinical setting.
- Creative mindset with strong analytical and problem-solving skills, complemented with a can do attitude.
- Good organizational skills and the ability to work independently in a structured way.
- A collaborative working style suited for interdisciplinary teams with clear communication skills.
- Experience in working with sensor data, including recording, processing, visualisation, and statistical analysis (experience with time-series analysis, real-world data, data annotation, and multimodal datasets are all a plus).
- Proficiency in Python.
- Basic German language skills for communication with patients.
- Enrolled in a Master's program at a university in Switzerland or the EU/EEA.

We offer

- A unique and stimulating work environment combining world-class rehabilitation practice with cutting-edge research.
- Access to research infrastructure, data, and expertise at the interface of healthcare, technology, and science.
- Direct exposure to and integration within an interdisciplinary clinical research environment including clinical and technical partners.
- The opportunity to contribute to research with potential impact on patient care and rehabilitation practices.
- Supervision and mentoring to support your professional development.
- A modern and flexible working culture, including options for remote work.
- Optional on-site accommodation.

Curios to explore this project with us?

We welcome applications that show a strong motivation to work with real-world clinical data, a can-do attitude, and a clear interest in pushing digital health research forward. Please submit your cover letter, CV and transcript of records to roman.kuster@llui.org. Questions regarding the position can be directed to the same contact. Further information about LLUI and the Therapy Science Lab is available at www.llui.org, further information about Luzerner Kantonsspital is available at www.luks.ch, and further information about activPAL is available at www.palt.com.