

**Master thesis topic: From Data to Insight
- Information Theoretic Data Mining for Movement Data -**

Within the research consortium "Dementia back in the heart of society", we are offering a Master Thesis topic* for a student with Computer Science** background.

About the consortium and project: With a multidisciplinary team, our goal is to capture the activities of daily living in a nursing home in Brabant, The Netherlands. The aim is to explore and describe how residents, visitors, and staff members use the buildings and park that is adjacent to the residential buildings. The student will help with the data collection of movement data using wearables. The collected data will then be used as a case study for the thesis project.

Research topic: Deep dive into one machine learning task and explore how information theoretic data mining can be used to achieve one of the tasks on the collected real-life data:

- Activity Recognition from accelerometer and gyroscope data
- Development of an Activity Intensity Scale for use in geriatric settings with the help of accelerometer and gyroscope data

Literature for first orientation:

- literature list of Master course Information Theoretic Data Mining: <http://eda.liacs.nl/teaching/itdm/>
- Overview of pattern mining tasks and current MDL-based solutions by E.Galbrun: <https://arxiv.org/abs/2007.14009>

Tasks during data collection week (week of May 3rd or May 10th 2021):

- Troubleshooting any problems with the fitness watches (back office, limited contact with study participants);
- Data handling and keeping an overview of study participants and used watches;
- Tech admin: charging, data export, and data storage during data collection;
- We expect you to join us for a full week; we will provide transport and accommodation for all interns.

Prerequisites:

- Team player and stress-resistant
- Programming skills: C (Tizen, the Samsung watch software stack is C with a bunch of APIs)
- Interest in information theoretic data mining

The team:

LIACS/Leiden University: Matthijs van Leeuwen (Associate Professor) and Daniela Gawehns (PhD student)

NIVEL (Dutch Health Research Institute): Sandra van Beek (Senior Researcher) and Suzanne Portegijs (PhD student)

You will be part of a data collection team of:

2 Bachelor Students Computer Science/Data Science (GPS traces of Park Visitors and Staff)

2 Master Students Psychology/Health Sciences (direct patient contact)

2 Research Assistants Physiotherapy/ Nursing (Quant and Qual observations)

*The project is also suitable for an Introductory Research Project (within the LIACS CS program).

** Data Science and AI students are welcome to apply. Please check the prerequisites regarding software development skills.

Contact:

Daniela Gawehns, gawehnsd@liacs.leidenuniv.nl