

3 PhD positions: Imaging biomarkers in heart/lung disease: quantification and AI

University Medical Center Groningen/University of Twente

3 PhD positions:

Early detection of the cardiothoracic diseases in large-scale imaging studies: imaging biomarker quantification, AI and AI education

Project background

Lung cancer, chronic obstructive pulmonary disease and cardiovascular disease, the so-called Big-3 (B3), are expected to cause most deaths by 2050. Early detection and prevention are crucial to lower the disease burden. Innovative low-dose computed tomography (CT) scanning allows assessment of early B3 imaging biomarkers. A challenge to establishing a B3 screening program is the lack of automated and standardized B3 imaging biomarkers. Within B3CARE, large-scale imaging projects in different populations, performed by UMCG researchers, are combined into an imaging data biobank. As a PhD student, you will use the imaging data biobank to determine imaging biomarker reference values, validate B3 biomarkers based on novel AI-based image analysis approaches, and design a computer assisted learning tool on AI in medical imaging. You will be part of the B3CARE project (funded by ZonMW and industry partners), with a close collaboration between University Medical Center Groningen (UMCG) and University of Twente (UT).

Job description

PhD position 1: This PhD project aims to determine reference values of COPD imaging biomarkers by age and gender. Focus is on application of novel image analysis techniques to detect and quantify early signs of airway disease on chest CT images, such as bronchial wall thickness. Collaboration exists with Erasmus MC (Biomedical Imaging Group Rotterdam, www.bigr.nl), where you will spend part of the PhD period to optimize an existing image analysis technique for subsequent use in ImaLife (Imaging in Lifelines) data.

PhD position 2: In this PhD project, you will use the multi-cohort imaging data biobank for validation and standardization of B3 imaging biomarkers, based on novel AI-based image analysis approaches. For this purpose you will harmonize collected data, generate well-annotated representative benchmark datasets and subsequently test AI-based software solutions.

PhD position 3: Within this PhD project, an educational program will be developed to give insight in the application of machine learning to medical imaging. The targeted audience is (technical) physicians. In addition, machine learning tools that are validated in B3CARE will be trained and implemented, and a computer assisted learning tool in AI will be designed and evaluated.

You will be part of a dynamic, multidisciplinary research team from UMCG and UT including other (PhD) students, technical medicine graduates, image analysis researchers, and clinical researchers. You will be supervised by experts in their respective fields. Validation of AI-based image analysis approaches are done in close collaboration with industry partners.

In PhD position 1 or 2 you will be registered within the Graduate School of Medical Sciences in Groningen where you graduate from the University of Groningen, Faculty of Medicine.

In PhD position 3 you will be registered within the Graduate School in Twente where you graduate from the University of Twente, Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS).

Work environment

The University Medical Centre Groningen, located in the center of Groningen, is one of the Netherlands' eight university medical centers and the largest employer in the Northern Netherlands. It has an ambitious, dynamic, international environment with state-of-the-art facilities. More than 10,000 employees provide patient care, are involved in medical education and perform cutting-edge scientific research, focused on healthy ageing. Data science and large-scale studies, such as LifeLines/ImaLife, are important focal points in Groningen.

“High Tech, Human Touch” is the motto of the University of Twente where about 3,300 scientists and professionals working together on cutting-edge research, innovations with real-world relevance and inspiring education for more than 9,000 students. The enterprising university, established in 1961, encourages students to develop an entrepreneurial spirit in close collaboration with Kennispark Twente: the UT is the university with the highest number of spin-offs (more than 600) in the Netherlands and one of the highest in Europe and possibly worldwide. Personalized technology for healthcare, amongst which imaging science and data science, is one of the focal points in the UT’s research themes.

Your profile

- You have a Master’s degree in (Technical) Medicine, Biomedical Technology, Computer science or related field
- You have experience with machine learning, image processing, and/or medical imaging is preferable
- You possess excellent communication skills in English; knowledge of Dutch is an advantage
- You have a flexible and collaborative attitude
- You are available to start the PhD project on or around July 1st, 2019

What do we offer?

- You will be appointed in a fulltime PhD position (36 hours at the UMCG/38 hours at the UT) for a period of 3.5 years. Prolongation may be possible depending on local funding.
- Salary according to the Dutch scale for PhD project research. Salary at the UMCG is € 2244,- gross per month in the first year up to a maximum of € 2874,- gross per month in the last year. Salary at the UT is €2325,- gross per month in the first year up to €2972 in the last year.
- Excellent benefits, including a holiday allowance of 8% of the gross annual salary and a year-end bonus of 8.3%
- Minimum of 23 holidays at the UMCG or 29 at the UT per year in case of fulltime employment.

The UMCG has a preventive Hepatitis B policy. You may be required to build up sufficient protection against Hepatitis B before you can be appointed. Vaccination is provided by the UMCG if necessary.

More information

Prof. Dr. R. Vliegenthart, r.vliegenthart@umcg.nl

Prof. Dr. Ir. C.H. Slump, c.h.slump@utwente.nl

Links

www.umcg.nl

www.utwente.nl

How to apply

Please use the digital application form at the bottom of this page to apply - only then your application will be processed. You can apply until May 6th. Immediately after sending the digital application form you will receive an email-confirmation with further information.

Interviews for the PhD positions will likely take place in Zwolle on May 23th. Please reserve this date for potential invitation.