

PhD Scholarship in the Division of Biomedical Imaging

Faculty of Medicine and Health
University of Leeds

Quantification of novel MR imaging biomarkers using machine learning for prognosis in Diabetic Kidney Disease

Supervisors: Kanishka Sharma, Dr Steven Sourbron

Funding: Boehringer Ingelheim BEAt-DKD funding

A PhD scholarship in machine learning is available for UK and EU citizens only. The scholarship will attract an annual tax-free stipend of £14,553 for up to 3 years, subject to satisfactory progress and will cover the UK/EU tuition fees.

You should hold a first degree equivalent to at least a UK upper second-class honours degree in a Computer Science, Mathematics, Physics or a comparable subject area. This project would suit a student with strong mathematical background and excellent programming skills in languages such as Python, C++, Java, MATLAB, etc. Experience in areas such as deep learning and computer vision considered beneficial. It is not mandatory to have prior knowledge of multi-parametric MR imaging data but this can be advantageous.

Candidate whose first language is not English must provide evidence that their English language proficiency is sufficient to meet specific demands of their study, the Faculty minimum requirements are:

- British Council IELTS - score of 6.5 overall, with no element less than 6.0
- TOEFL iBT - overall score of 92 with the listening and reading element no less than 21, writing element no less than 22 and the speaking element no less than 23.

Research Project:

The successful candidate will participate in a major international EU-funded (public-private partnership) research project, *Biomarker Enterprise to Attack Diabetic Kidney Disease* (BEAt-DKD). The BEAt-DKD project aims to identify and validate improved prognostic biomarkers for development of effective and personalized treatments for Diabetic Kidney Disease (DKD).

This PhD position aims to support the BEAt-DKD project by developing efficient methods for quantification of (novel) imaging biomarkers in DKD from multi-centric, multi-parametric magnetic resonance imaging (MRI) data. The imaging work is led by the University of Leeds and involves close collaboration with other academic sites in the UK (Exeter), France (Bordeaux), Italy (Bari) and Finland (Turku).

You will develop new and innovative machine learning algorithms for automated segmentation of kidneys from MR imaging datasets. This will include quality assurance, automated segmentation of kidneys and, post-processing of multi-parametric MRI using state-of-art image processing algorithms ensuring high accuracy, precision and reproducibility for translation at other international sites involved in the study.

Benefits:

- Strong benefit from collaborations within the project, both at the University of Leeds and internationally with clinicians and basic scientists from broad backgrounds (biology, MRI physics, nephrology, physiology). The project draws heavily on collaborations with industry and SME's, providing an excellent opportunity to scout out different possible career paths.
- Opportunity to participate and present at international conferences, attend summer schools and workshops on new developments in machine learning methods and MRI processing techniques.

Reference:

[1] Grenier, Nicolas, Pierre Merville, and Christian Combe. "Radiologic imaging of the renal parenchyma structure and function." *Nature reviews. Nephrology* 12.6 (2016): 348.

[2] Sharma, Kanishka, et al. "Automatic Segmentation of Kidneys using Deep Learning for Total Kidney Volume Quantification in Autosomal Dominant Polycystic Kidney Disease." *Scientific Reports* 7 (2017).

Relevant links:

- medhealth.leeds.ac.uk/news/article/1139/launch_of_beat-dkd
- www.lunduniversity.lu.se/article/an-innovative-medicines-initiative-project-for-precision-medicine-in-dkd
- www.imi.europa.eu/content/beat-dkd

How to apply:

To apply for this scholarship applicants should complete a [Faculty Scholarship Application form](#) and send this alongside a full academic CV, degree transcripts (or marks so far if still studying) and degree certificates to the Faculty Graduate School fmhgrad@leeds.ac.uk Please indicate 'BEAT-DKD Scholarship' in the scholarship section of the form.

We also require 2 academic references to support your application. Please ask your referees to send these [references](#) on your behalf, directly to fmhgrad@leeds.ac.uk by no later than **Friday 29 September 2017**.

If you have already applied for other scholarships using the Faculty Scholarship Application form you do not need to complete this form again. Instead you should email fmhgrad@leeds.ac.uk to inform us you would like to be considered for this scholarship project.

Any queries regarding the application process should be directed to fmhgrad@leeds.ac.uk

For any project specific queries please email Kanishka Sharma (k.sharma@leeds.ac.uk) or Dr Steven Sourbron (s.sourbron@leeds.ac.uk) directly.

Closing date for this Scholarship is Friday 29 September 2017