UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Deep Learning for Population Cardiac Image Analysis, School of Computing, Faculty of Engineering

Salary: Grade 7 (£33,199 – £39,609 p.a.)

Reference: ENGCP1096

Closing date: 02 April 2019

Fixed-term 18 months

We will consider flexible working arrangements

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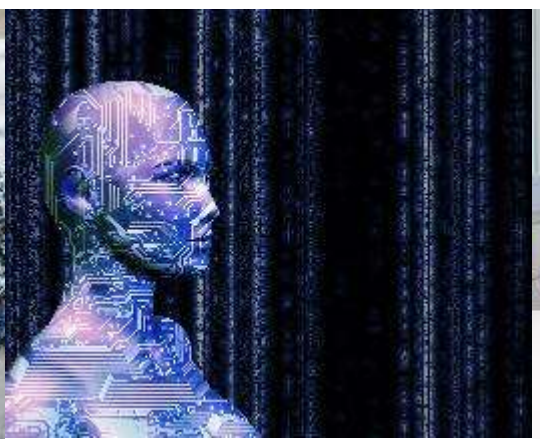
Are you an early-career researcher who enjoys finding innovative solutions to unmet clinical needs and translating deep learning in medical image analysis to the clinic? Do you have a background in medical image computing and experience with working collaboratively with clinicians and clinical image databases? Do you have a passion for developing statistical deep Bayesian methods for medical image analysis? Are you ready to think out-of-the-box, innovate and find solutions to challenging problems?

The Centre for Computational Imaging and Simulation Technologies in Biomedicine (CISTIB), within the Faculties of Engineering and Medicine & Health, involves various academics and their research groups. CISTIB focuses on algorithmic and applied research in the areas of computational imaging, and image-based computational physiology modelling and simulation. CISTIB contributes in different areas of medical image computing and image-based biomechanical and computational physiology modelling. CISTIB works in close cooperation with clinicians from various research centres from the University of Leeds and the academic hospitals of the Leeds Teaching Hospital Trust Foundation, the largest NHS Trust of the UK.

Clinical areas where CISTIB members have contributed to and made substantive innovations in the field are focused around the cardiovascular, musculoskeletal and neural systems, where they have developed diagnostic and prognostic quantitative image-based biomarkers and methods and systems for interventional planning and guidance. The centre hosts academic members from the University of Leeds and Research Fellows, Research Associates, PhD Students and Scientific Software Developers forming a cross-disciplinary team committed to clinical translation of their innovations.

You will be part of the EPSRC funded BIANDA project and develop a full probabilistic atlas to accurately evaluate bi-ventricular motion abnormalities by integrating cardiac magnetic resonance (CMR) and metadata from a large population. The motion will be modelled as the spatiotemporal (3D+t) sequence of the heart shapes across the full cardiac cycle, extracted from cine CMR images. The atlas will be a Bayesian recurrent model that, given a sequence, it will predict a probabilistic distribution function (pdf) for the next status of the heart. More importantly, the pdf will be conditioned on the


patient's metadata. The atlas will be derived from the UK Biobank CMR study aiming to scan n>100,000 patients by 2022. The training of the atlas will be pursued as the new releases of the data sets from the UK Biobank becomes available. The PI has an extensive experience in developing Bayesian and non-Gaussian statistical atlases from shapes and you will have the opportunity to closely teamwork with him. He has established collaboration with the clinical advisor for this study and has full access to the CMR data sets.

What does the role entail?

As a Research Fellow, your main duties will include:

- Developing innovative statistical DL methods for motion atlas construction in cardiac MRI to run on existing large-scale databases like the UK-Biobank;
- Developing novel machine learning approaches to tackle various types of imaging and non-imaging big data;
- Developing fully automated workflows that can be run without user intervention in large-scale cloud-computing platforms to facilitate population CMRI analysis;
- Generating and pursuing independent and original research ideas in the appropriate subject area;
- Developing research objectives and proposals and contributing to setting the direction of the research project and team including preparing proposals for funding in collaboration with colleagues;
- Evaluating methods and techniques used and results obtained by other researchers and relating such evaluations appropriately to your own work;
- Preparing papers for publication in leading international journals and disseminating research results through other recognised forms of output;
- Working both independently and also as part of a larger team of researchers, engaging in knowledge-transfer activities where appropriate and feasible;
- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues as appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including assisting with the supervision of projects in areas relevant to the project.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.



What will you bring to the role?

As a Research Fellow, you will have:

- A PhD (or have submitted your thesis before taking up the role) in cardiac MRI image analysis;
- A strong background in machine learning, statistical image analysis, and medical image computing;
- A proven track record of peer-reviewed publications in high impact factor journals, preferably in the area of medical image computing and analysis;
- Proven experience in conducting innovative research and scholarship recognised internationally in terms of originality, significance and rigour;
- Good time management and planning skills, with the ability to meet tight deadlines and work effectively under pressure;
- Excellent written and verbal communication skills including outstanding presentation skills;
- Proven ability to manage competing demands effectively, responsibly and without close support and supervision;
- Experience in supporting MSc/PhD students and postdoctoral colleagues fostering a culture of mutual support;
- A proven ability to work well both individually and in a team;
- A strong commitment to your own continuous professional development.

You may also have:

- Commitment to develop skills for pursuing external funding to support research.

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information page. Applications should be submitted by 23.59 (UK time) on the advertised closing date.

Contact information

To explore the post further or for any queries you may have, please contact:



Dr Ali Gooya, School of Computing
Tel: +44(0)113 343 1949
Email: a.gooya@leeds.ac.uk

Additional information

Faculty and School Information
Further information is available on the research and teaching activities of the Faculty of Engineering and the School of Computing.

A diverse workforce
The Faculty of Engineering is proud to have been awarded the Athena Swan Silver Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our equality and inclusion webpage provides more information.

Working at Leeds
Find out more about the benefits of working at the University and what it is like to live and work in the Leeds area on our Working at Leeds information page.

Candidates with disabilities
Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our Accessibility information page or by getting in touch with us at disclosure@leeds.ac.uk.

Criminal record information

Rehabilitation of Offenders Act 1974

A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information page.