CANDIDATE BRIEF

Research Fellow in Image-based Computational Modelling in Cardiology, Faculty of Engineering

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

Reference: ENGCP1102

Closing date: 11 August 2019

Fixed-term for up to three years

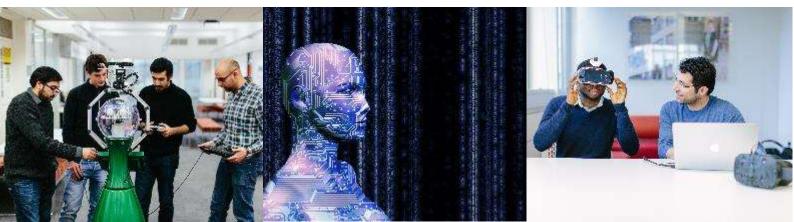**We will consider flexible working arrangements**

Research Fellow in Image-based Computational Modelling in Cardiology
School of Computing

Are you an early-career researcher who enjoys finding solutions to challenging problems in translational biomedical engineering? 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 combining computational algorithms, modelling and simulation to address key problems in virtual in silico trials? 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 InSilc project, where CISTIB in collaboration with groups across Europe seeks to develop an in-silico clinical trial platform for designing, developing and assessing drug-eluting bioresorbable vascular scaffolds (BVS). Using your knowledge of image analysis and computation (covering topics like image registration, statistical models, and centreline models), you will contribute to the development of methods for highly-automated and robust construction of image-based models of the

coronary vasculature and the simulation of coronary flow dynamics. You will contribute technical and scientific developments that fulfil the project objectives.

What does the role entail?

As a Research Fellow, your main duties will include:
- Developing innovative methods for image-based statistical modelling of coronary vascular anatomy that are robust and automated to run on existing large-scale databases available to the consortium;
- Developing fast methods for simulating coronary flow in one-dimensional centreline models that couple with three-dimensional models of coronary flow dynamics and myocardial perfusion.
- Developing fully automated workflows that can be run without user intervention in large-scale cloud-computing platform in order to facilitate virtual in silico trials of BVS devices;
- Writing and disseminating results of the research amongst project collaborators, and among the wider scientific community via publications in peer-reviewed, high-impact scientific journals and presentations at national and international scientific conferences;
- Assisting CISTIB academics in the preparation of proposals and applications to external bodies and in your area of expertise;
- Participating in and supervising group activities such as seminars and monthly team meetings, public engagement and dissemination activities;
- Continuously updating your knowledge in the area of image-based modelling by undertaking training and personal development as required;
- Assisting in periodic reporting relating to InSilc project management.

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 close to completion) or equivalent degree (or close to completion) in a relevant area of computer science, electrical engineering, mathematics or another related field;

- Some experience working with DICOM images and image processing libraries (VTK, ITK or PyDICOM);
- Programming skills using with scientific software development frameworks such as MATLAB, NumPy/SciPy etc;
- Working knowledge of statistical shape models and their application to human anatomy;
- Effective communication skills, with the ability to understand user requirements and communicate technical information to clinical partners, and to disseminate the research work and outcomes to both the scientific community and the wider scientific community;
- Ability to actively engage with clinical and industrial collaborators to better understand the clinical problems which motivate the research and to ensure that the solutions developed are viable;
- Ability to work effectively as part of a multidisciplinary team and to collaborate, co-operate and participate with others to achieve common objectives, sharing experience and ideas, and working together to make the most of technology and innovation breakthroughs;
- Ability to grow as an early-career researcher and in the future take leadership of a small team of early-career researchers with responsibilities of thesis supervision and day-to-day organisation of research tasks;
- A commitment to a positive, inclusive and equal working environment.
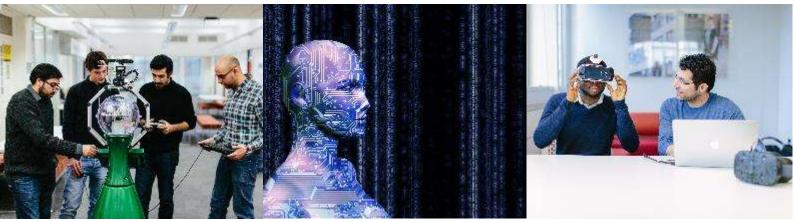
How to apply

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:

Professor Alex Frangi, Diamond Jubilee Chair of Computational Medicine
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Email: a.frangi@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.