UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Computational Modelling of the Knee,

Faculty of Engineering & Physical Sciences

Salary: Grade 7 (£33,797– £40,322 p.a.)

Reference: EPSME1026

Closing date 03 September 2020

Fixed-term till 30 September 2021

We will consider flexible working arrangements

Research Fellow in Computational Modelling of the Knee, Institute of Medical & Biological Engineering, School of Mechanical Engineering.

Do you have a strong technical background in computational mechanics with an interest in biomedical engineering? Would you like to work as part of a multidisciplinary team to address a clinically-driven challenge?

This project is part of a major £4M EPSRC Programme Grant on Optimising Knee Therapies. The aim of the programme is to develop preclinical testing methods for early-stage treatments for knee osteoarthritis so their performance can be optimised.

In the UK, one third of people aged over 45 have sought treatment for osteoarthritis. The knee is the most common site for osteoarthritis and there is a major unmet clinical need for effective earlier stage interventions that delay or prevent the requirement for total knee replacement surgery. Meniscus damage and degeneration are linked to both the onset and progression of osteoarthritis. A number of partial and total meniscus replacements have been developed, but clinical outcomes are variable, likely because of differences in both patient anatomy and surgical technique.

The aim of this project is to develop computational models to evaluate meniscus replacement, specifically meniscal allografts, and examine how patient and clinical variables will affect outcome. You will join a team developing finite element models of the tibiofeomoral joint, and will use data from ongoing experimental work to provide model inputs and for direct validation of the predictions.

You will have a strong background in finite element analysis related to tribology or material interfaces and contact mechanics, and have a proactive approach to working in a multidisciplinary team with engineers, biologists and clinicians.

What does the role entail?

As a Research Fellow, your main duties will include:

- Leading the development of finite element models that represent the meniscus within the tibiofemoral joint to evaluate the mechanical and tribological performance of meniscal allografts;

- Undertaking sensitivity and parametric tests to determine how variables associated with the meniscus replacement (e.g. size, location, and attachment sites) and patient (e.g. anatomical and tissue properties) affect the outcome;
- Working with colleagues undertaking experimental tests by a two-way transfer of information and learning. This includes using the models to inform the experimental testing and using the experimental data to validate the models;
- Documenting the methods developed and the results obtained, and working collaboratively towards the shared objective of curating data and processes so that they can be adopted by others;
- Preparing papers for publication in leading international journals and independently writing reports;
- Communicating or presenting research results through publication or other recognised forms of output, including presenting your results at leading international conferences;
- Working both independently and also as part of a larger team of researchers
- Maintaining your own continuing professional development;
- Potentially contributing to the training of undergraduate or postgraduate students, including assisting with the supervision of projects in areas relevant to the project;
- Participating in the Institute of Medical and Biological Engineering (iMBE) public and patient engagement activities;
- Working within and applying the standard operating procedures, health and safety regulations and quality assurance procedures of the School, Faculty and University.

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) in medical engineering or a related discipline, which includes aspects of computational modelling;
- Experience in finite element modelling (ideally in Abaqus), including either image-based geometry or simulation of contact;

- The ability to write code for data analysis or software scripting, ideally within a finite element software package;
- A solid background in finite element theory, including an aspect of non-linearity;
- Experience of successful experimental design and data interpretation in computational research;
- Experience of working collaboratively in a multidisciplinary team;
- Good time management and planning skills, with the ability to meet tight deadlines, work effectively under pressure and carefully document the work undertaken;
- A proven track record of peer-reviewed publications in high impact factor journals, or international conference presentations, commensurate with level of experience;
- Excellent written and verbal communication skills including presentation skills;
- Proven ability to manage competing demands effectively, responsibly and without close support;
- A strong commitment to your own continuous professional development.

You may also have:

- Experience in musculoskeletal biomechanics;
- Experience in knee biomechanics;
- Experience of modelling non-linear materials;
- Experience of making contributions to open-source code or using version control;
- Experience of dealing with human or animal tissue.

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 Alison Jones, Lecturer
Tel: +44 (0)113 343 2099

Email: A.C.Jones@leeds.ac.uk

Additional information

Faculty and School Information
Further information is available on the research and teaching activities of the Faculty of Engineering & Physical Sciences, and the School of Mechanical Engineering and the Institute of Medical & Biological Engineering.

A diverse workforce

The Schools in the Faculty of Engineering & Physical Sciences are proud to have been awarded the Athena SWAN Bronze or 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.