

OXFORD UNIVERSITY COMPUTING LABORATORY

euHeart: Biophysically-based modelling for the treatment of cardiovascular disease

Grade 7 Post-Doctoral Research Scientist

Further Details

The Computing Laboratory has two vacancies for Post-Doctoral Research Scientists as part of an EU funded research project “euHeart” which runs from the 1st of June 2008 till the 1st of June 2011. The work will be focused on the development of computational fluid-mechanical models of the heart. This work will involve the application of multi-scale modelling techniques and numerical methods to produce validated and personalised models from unique data collected by our collaborators. This exciting project will provide the successful candidate with the opportunity to interact with members of the partner sites in France, Germany, Spain, Netherlands, and the UK. As such the role will form a central part of a multi-disciplinary collaboration between academic, clinical and industrial partners working across modelling, imaging and device design.

euHeart

The aim of the euHeart project is to incorporate ICT tools and integrative multi-scale computational models of the heart within clinical environments to improve diagnosis, treatment planning and interventions for Cardiovascular diseases and thus to reduce the allied healthcare costs. These computational models also provide an excellent basis to optimize the design of implantable devices for improved therapy. The opportunity of multi-scale modelling spanning multiple anatomical levels (sub-cellular level up to whole heart) is to provide a consistent, biophysically-based framework for the integration of the huge amount of fragmented and inhomogeneous data currently available. Models for heart failure and arrhythmias will incorporate the mechanisms for cell force generation at the sub-cellular level to the fluid-mechanical properties of the chamber and heart wall to capture contractile dynamics.

Main Duties and Responsibilities

Main duties for this role will include:

- The development of existing continuum mechanics software to perform coupled fluid-mechanics simulations
- The customisation and personalisation of cardiac models to patient specific data
- The interpretation of medical image data using the modelling
- Travel and interaction with academic and industrial partners engaged in data collection and device design respectively.

Selection Criteria

The successful applicant will have many, but not necessarily all, of the following skills:

- A PhD or equivalent qualification in the mathematical, computational or physical sciences;
- A strong background in mathematical modelling. Previous work in nonlinear mechanics and/or computational fluid dynamics as applied to biological problems will be an advantage.
- Experience in the application of numerical techniques applied to complex mathematical models such as FEM, finite differencing and ALE.
- Experience in visualisation and analysis of multi-dimensional data sets
- A high level of Fortran90 and/or C++ programming ability

- A desire to translate scientific research into clinical outcomes.
- Good English language skills, both written and verbal;
- Good communication skills and willingness to interact with project partners from a variety of EU countries;

Salary and Benefits

The post, which is a full-time fixed term appointment has a salary on the University grade 7 scale (currently £27,466 to £33,780 pa); includes membership of USS; has an annual leave entitlement of 38 days per year (pro-rata) inclusive of all public holidays and university closed periods, and is available for immediate start.

Method of Application

Applications should be in the form of a *letter of application* relating the candidates skills to the post selection criteria, together with a full Curriculum Vitae and the names and addresses of two referees. **Candidates should state clearly which post they are applying for.**

The application should preferably be sent by email (most formats accepted) to: job09@comlab.ox.ac.uk

or by post to: The Administrator,
Oxford University Computing Laboratory,
Wolfson Building
Parks Road,
Oxford OX1 3QD.

Applications should be sent in time to arrive by 5:00 p.m. on **Thursday 5th June 2008**. Applications received after this time will not be considered.

Candidates must ask their referees to consider the further particulars and email the reference directly to job09@comlab.ox.ac.uk or, alternatively, post it to the above address (fax (+44 1865 283532)) so that references arrive by the closing date.

The policy and practice of the University of Oxford require that all staff are afforded equal opportunities within employment and that entry into employment with the University and progression within employment will be determined only by personal merit and the application of criteria which are related to the duties of each particular post and the relevant salary structure. In all cases, ability to perform the job will be the primary consideration. Subject to statutory provisions, no applicant or member of staff will be treated less favourably than another because of his or her sex, marital status, sexual orientation, racial group, or disability.