**UNIVERSITY COLLEGE LONDON**

**Job Description and Person Specification**

**Job Title**: PhD Studentship in Photoacoustics 3D Image Reconstruction for Image-guided Fetal Surgery

**Department**: Medical Physics and Bioengineering

**Subsection**: Translational Imaging Group (TIG) within the Centre for Medical Imaging Computing (CMIC)

**Duration** : 4 Years (1 year MRes, 3 years PhD)

**Stipend:** 16,851 per annum tax-free, Fees paid for.

**Project outline:**

Applications are invited for a PhD funding opportunity based within the Translational Imaging Group of the Centre for Medical Image Computing at UCL, commencing in September 2014.

UCL was recently awarded £10million to develop better tools and imaging techniques that will improve the success of surgery and other therapies on unborn babies in collaboration with KU Leuven, Great Ormond Street Hospital and University College London Hospital. Photoacoustics imaging, a hybrid imaging modality that delivers low-energy laser pulses to generate acoustic waves in response to a transient heating and monitors the resulting ultrasounds with a transducer, promises to drastically improve the quality of the information collected during the surgery. However, with the translation of photoacoustics in situ and in vivo, it is expected than only a small number of depth-measurements or A-scans will be acquired simultaneously. As such there is a need for a method to reconstruct 3D images from a collection of consecutive A-scans.

This PhD project will develop a system to reconstruct such 3D data. Tracking sensors may be embedded on the photoacoustic probe to guide the reconstruction process but a proper understanding of the physics of acquisition will also be required to extract motion information from the correlation within the consecutive A-scans. Close collaboration with the Photoacoustics Imaging Group based within the department is to be expected. Candidates with a strong interest in the following areas are encouraged to apply: computer-assisted interventions, medical image analysis and analysis, medical device development, and translational applications of medical image computing. Informal enquiries are welcomed.

**To apply**: Please go to: <https://www.prism.ucl.ac.uk> . Under "Opportunities" there is a scroll down box with the title of this project. Please click the Apply Now button.

The studentship compromises of fees and a tax-free stipend of £16,851 per annum. In order to qualify candidates must be UK/EU passport holders or qualify for UCL home fees status.

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If you wish to discuss this opportunity, please contact Prof. Seb Ourselin ([s.ourselin@ucl.ac.uk](mailto:s.ourselin@ucl.ac.uk)) or Dr. Tom Vercauteren ([t.vercauteren@ucl.ac.uk](mailto:t.vercauteren@ucl.ac.uk) ) but please note applications need to be submitted using the above instructions.

**Deadline for applications**: **Monday, July 14th, 2014**

**Person Specification:**

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|  | **Essential** | **Desirable** |
| **Knowledge, Education, Qualifications**  **and Training**  Upper Second Honours degree (or equivalent) in Physics, Engineering, or Computer Science from a recognised university. | \*\*\* |  |
| **Skills and/or Abilities**  Strong mathematical abilities  Strong problem solving abilities  Good understanding of the physical basis for medical imaging (MRI, Ultrasound)  Ability to develop computer object-oriented software using C++ and python  Understanding of the principles and practice of digital image processing and medical image analysis  Ability to work effectively within a collaborative environment  Proficiency in MATLAB programming  Excellent written and spoken communication skills in English. | \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\* |  |
| **Experience**  Experience of algorithm and software development for medical image analysis, digital image processing or computer vision. | \*\*\* |  |
| **Other requirements**  Strong interest in medical image analysis and the application of imaging technology to solving medical problems | \*\*\* |  |