**UNIVERSITY COLLEGE LONDON**

**Job Description and Person Specification**

**Job Title**: PhD Studentship in Real-time View Expansion and Visual Servoing 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. Key to this widely scoped endeavour is the interaction between the information provided by real-time imaging, notably fetoscopy, and the robotic actuators to be developed for fetal surgery. Although visual servoing is a standard tool in traditional robotics, its application to robotic fetal surgery poses a number of challenges due in part to the large deformations happening in the surgical scene but also due to the small field of view of the fetoscope.

This PhD project will focus on the extraction of localisation information from the fetoscopic view. A first objective will be to register, in real-time, the consecutive images of the video stream so as to dynamically expand the field of view through the construction of a mosaic image. Visual servoing will then be built on top of the real-time registration. Applications include compensation of physician tremor and application of motion constraint to protect the uterine wall and fetal membrane. Close collaboration with the Mechanical Engineering department at KU Leuven, Belgium is to be expected. Candidates with a strong interest in the following areas are encouraged to apply: medical image registration, visual servoing, computer vision, translational applications of medical image computing, and real-time image processing. 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.

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 must 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 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 | \*\*\* |  |