**UNIVERSITY COLLEGE LONDON**

**Job Description and Person Specification**

**Job Title**: Software Engineer (Senior / Research Associate): Fetal Intervention Instrumentation

**Department**: Medical Physics and Bioengineering

**Reports to**: Dr. Tom Vercauteren

**Responsible to:** Prof. Sebastien Ourselin (Project Lead, CMIC); Prof. Jem Hebden (HoD)

**Duration**: 3 years in the first instance funded by the Wellcome Trust and EPSRC

**Salary:** UCL Grade 7, £32,699 - £39,523; Grade 8 £40,618 - £47,915 per annum inclusive of London Allowance.

**Project Title:** Image-Guided Intrauterine Minimally Invasive Fetal Diagnosis and Therapy

**Main Purpose of the Post:**

UCL was recently awarded £10million from the Wellcome Trust and EPSRC 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.

The successful candidate will design and develop an API to control and drive the hardware components stemming from the project. This will require wrapping the low-level hardware drivers into a high-level C++ library and automating the different necessary hardware controls, e.g. calibration pipeline, feedback loops, etc. The position does not require experience of electronics development although understanding of the basis would be a plus.

In addition, the candidate will work on the integration of the existing software building blocks into clinically usable software application. The main challenge being to design lean graphical user interfaces to allow the clinicians to drive the surgical platform.

The overall objective of the project is to go from bench to bedside to first in-man clinical trials, the candidate will also contribute to other software development and will ensure scalability of the designed software.

**Duties and Responsibilities:**

* To undertake research as stated in the Main Purpose.
* To play an active role in the Fetal Project Group and the Translational Imaging Group, contributing to meetings and overall activities.
* To prepare and present findings of research activity to colleagues, interested parties and at appropriate conferences.
* To help and support the submission of research grant proposals.
* To contribute to the drafting and submitting of papers to appropriate peer reviewed journals.
* To participate in departmental and faculty seminars aimed at sharing research outcomes and building interdisciplinary collaboration within and outside the department.
* To assist with the supervision and teaching of MSc and PhD students within the group as requested.
* To carry out any other duties as are within the scope, spirit and purpose of the post.
* To actively follow UCL policies including equal opportunities and race equality policies;
* To maintain awareness and observation of fire and health and safety regulations;

As duties and responsibilities change the job description will be reviewed and amended in consultation with the post holder.

**Person Specification:** Software Engineer (Senior / Research Associate): Fetal Intervention Instrumentation.

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|  | **Essential** | **Desirable** |
| **Knowledge, Education, Qualifications**  **and Training**  Upper Second Honours degree (or equivalent) in Physics, Computer Science, Biomedical Engineering, or a closely related discipline.  PhD in Medical Imaging, Computer Science or a closely related subject or equivalent industry experience. | \*\*\*  \*\*\* |  |
| **Skills and/or Abilities**  Strong expertise in object-oriented software development in C++ and Python  Ability to propose and apply design patterns methodologies for new developments and refactoring endeavours  Ability in software development methodologies (unit testing, coding standards, continuous integration, code coverage improvement, static analysis)  Ability to work in cross-platform environments (Mac OS, Linux, Windows, 32/64 bits setups) with various compilers (e.g. clang, icc, gcc, Visual C++)  Knowledge of GPU development tools (e.g. CUDA, OpenCL)  Knowledge of hardware and network control methodologies and protocols (e.g. ASIO, USB, IEEE1394, sockets)  Ability to design lean user interfaces (e.g. using QML, Qt designer, VTK, etc.)  Proficiency in documenting code using standard tools (e.g. doxygen, user manuals)  Strong mathematical abilities.  Strong problem solving abilities.  Ability to present results publicly in poster and platform presentations.  Ability to work effectively within a collaborative environment  Ability to work independently.  Knowledge in MATLAB programming  Excellent written and spoken communication skills in English | \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\* | \*\*\*  \*\*\*  \*\*\* |
| **Experience**  Practical experience of algorithm and cross-platform software development for medical image computing, digital image processing and/or computer vision  Experience of publishing high quality research results.  Established publication track record.  Practical experience with high-level libraries, e.g. STL, Boost, Qt.  Development and use of hardware control tools (e.g. Boost ASIO)  Experience with the following tools:   * CMake * CDash * CPack * Valgrind * Git   Experience with parallel computing developments (e.g. C++11 threads, ITBB, OpenMP, CUDA, OpenCL)  Experience in working on commercial or large-scale software systems following modern system development methodologies.  Experience with Good Manufacturing Principles (GMP) for clinical software development  Experience of supervising PhD or MSc students. | \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\* | \*\*\*  \*\*\*  \*\*\* |
| **Other requirements**  Strong interest in medical image computing and the application of imaging technology to solving medical problems  Grade 8:  In order to be considered for a grade 8, in addition to above, candidates will have significant experience. | \*\*\*  \*\*\* |  |