PhD Studentship: Feasibility of novel mm-size biomolecule analyser microchips

Project Description

Applications are invited for a PhD studentship to join the UCL Aspire CREATe Centre for Rehabilitation Engineering and Assistive Technology (Aspire CREATe), which is located in the Royal National Orthopaedic Hospital (RNOH), the largest orthopaedic hospital in the UK. Aspire CREATe is a part of a UCL Faculty of Engineering Sciences and UCL Faculty of Medical Sciences. Founded in 1826, UCL is one of the world’s leading universities focused on research excellence and teaching. The student will be registered with UCL will be based at the UCL/RNOH Stanmore campus.

Studentship Description

We are looking for a motivated student with an interest in developing new disruptive technologies for biomedical diagnostics. Our primary goal in this project is to develop fully-integrated mm-scale microchips that are capable of real-time analysis of small biomolecules in biofluids. We plan to employ the outcomes of this research project in creating low-cost diagnostic tools (e.g. wearing biosensors) for large scale investigation of biomarkers of health and wellbeing in humans.

The student will be working under the supervision of Dr Sara Ghoreishizadeh and Dr Anne Vanhoestenberghe to design and develop a monolithically integrated systems based on semiconductor and electrochemical sensor technologies. In particular, the student will design, develop and test integrated instrumentation circuits (analogue/mixed-signal IC). This will be followed by post-process fabrication of an array of amperometric electrochemical sensors on-chip. The tools developed in the project will enable low-cost large-scale investigation of specific biomarkers in pathology of pain.

The student is expected to publish the outcome of the project in multiple articles for top journal and conference of the field and attend at least one international conference every year.

Person Specification

Essential:
At least an upper second-class honours degree (2:1 or equivalent qualification) in Electrical engineering, bioengineering, or equivalent professional experience. Experience in analogue integrated circuit design. Proven experience of PCB design. Experience working with IC design softwares such as Cadence.
Knowledge of design and analysis software tools such as C/C++, MATLAB, and PCB design softwares.
Analytical skills: ability to think independently, interpret data, and knowledge of statistics (e.g. basic data clustering and classification methods).
Strong verbal and written communication skills both in plain English for dialogue and scientific language for communication with team members and academic staff, publication in relevant journals and presentation at conferences.

Desirable:
Experience in development and test of integrated circuits in sub-micron technology.
Knowledge/experience working with electrochemical sensors.
Knowledge of electrochemical measurement techniques, such as Cyclic Voltammetry, electrochemical Impedance Spectroscopy.
A strong team player with good interpersonal skills able to build and sustain effective communication and working relationships with researchers from different disciplines.
Flexible, able to work collaboratively.
Self-motivated researcher with a hand-on approach, willing to develop their technical and analytical skills and contribute to the overall aim of the research project in innovative ways.
Proven organisational and excellent communication skills.

Eligibility
The studentship covers the fees for UK/EU students ONLY. Additional fees may be required for students who do not fulfil UCL’s criteria to be considered a home student.

Please check the UCL website for full criteria at: https://www.ucl.ac.uk/prospective-students/graduate/taught-degrees/fees-and-funding

To apply for the vacancy please email your CV, full transcript, and covering letter to Dr Sara Ghoresihizadeh (s.ghoreishizadeh@ucl.ac.uk) and Dr Anne Vanhoestenberghe (a.vanhoestenberghe@ucl.ac.uk). Your covering letter should explain your interest in the project, previous research experience (including example of previous project work) and why you would be a suitable candidate for this post.

If you have any queries on the application process, please contact Kathryn Knapp on k.knapp@ucl.ac.uk quoting job reference 1835232.