National Centre for Sensor Research

Postdoctoral Researcher

Adaptive Sensors Group, CLARITY Centre for Sensor Network Technologies
Wearable Chemical Sensors for Real-Time Analysis of Sweat Composition

(2 Year Contract)

Background
The project is co-sponsored by Underarmour™, a specialist sports apparel manufacturer based in Baltimore, USA (see www.underarmour.com) and IRCSET under the Enterprise Partnership Scheme. The successful candidate will join the Adaptive Sensors Group (ASG, see www.dcu.ie/chemistry/asg/), a large, multidisciplinary research unit hosted by the National Centre for Sensor Research (NCSR, see www.ncsr.ie), in state-of-the-art facilities situated on the campus of Dublin City University. Core funding for the ASG is provided by Science Foundation Ireland through the CLARITY CSET (www.clarity-centre.org), supplemented by significant project based income provided by IRCSET, Enterprise Ireland, the Marine Institute, The EPA, EU-FP7, and Industry partners.

Wearable sensors such as heart rate monitors and pedometers are increasingly used by people involved in sports and exercise activities. This area is growing exponentially, and while it is mainly driven by interest from health/sports enthusiasts, it will increasingly expand into health monitoring, as the economics of healthcare will force trends towards remote (home based) monitoring of patient status, rather than the current hospital focused model. In particular, the true potential of wearable chemical sensors for the real-time ambulatory monitoring of body fluids such as tears, sweat, urine and blood has not been realised due to difficulties associated with sample generation, collection and delivery, sensor calibration and reliability, wearability and safety issues. This project will seek to advance the science and engineering required to deliver reliable wearable chemical sensing platforms integrated with microfluidic sampling and wireless access to the data generated by these platforms.

Role
The successful candidate will join the Adaptive Sensors Group in DCU and will be fully trained up in the relevant engineering and science required to product specialist wearable microfluidic-based chemical sensing platforms for sweat monitoring applications, specifically to monitor sweat composition in real-time during exercise. He/she will work closely with Underarmour staff and the ASG project team and will also be briefed on the context and the importance of the project in the area of wearable sensors and the potential value in terms of future markets.

During the project the researcher will be required to complete regular reports. He/she will also have the opportunity to present their work to a wider research community through presentations at seminars/symposiums.

Duties & Responsibilities
The Postdoctoral Researcher will be required to perform the following duties:

- Develop the initial design based on wearable chemical sensing platform which will include
  - Integration of electrochemical and optical chemical sensing strategies with wearable polymer microfluidics sampling unit
  - Integration of strategies for harvesting data remotely (untethered); e.g. visual examination of colorimetric sensors, electronic & wireless transmission of data from the wearable platform, digital imaging etc.
  - Design of packaging for sensor components and interface with the wearer
- Organise and report on laboratory trials
- Define protocols for production and use of the platforms
- Validate prototype devices in clinical/outdoor/field trials using reference equipment
• Analyse and present regular reports to Prof. Diamond and specified Underarmour staff (e.g. using Skype, email, t-cons, or face-to-face meetings in Ireland and the USA)
• Generate and present final report upon completion of the project
• Work as part of a multidisciplinary team, interacting positively with other group members on a regular basis
• Attend and participate in group meetings
• Undertake other tasks as required by the group PI, Professor Dermot Diamond

Skills and Experience
Applications are invited from candidates holding a PhD in which one or more of the following was a significant component: wearable sensors, chemical sensor fabrication, applications in personal health monitoring, polymer microfluidics, biomedical engineering, mechatronics and materials chemistry. Candidates should also have an honours (2.2 honours minimum) primary degree in analytical science, chemistry, physics, materials science or a related subject. The ideal candidate should also have experience in platform integration, wireless communications technologies and/or image processing.

Informal enquiries to:
Professor Dermot Diamond, Director, National Centre for Sensor Research, DCU.
E-mail: Dermot.Diamond@dcu.ie, Tel: +353 (0)1 700 5404 Fax: +353 (0)1 700 8021

Salary scale: €31,275

Closing date: 13 July 2012

Application forms are available at:

www.dcu.ie/vacancies/APPLICATION_FORM_8pg.doc and from the Human Resources Department, Dublin City University, Dublin 9. Tel: +353 (0)1 700 5149; Fax: +353 (0)1 700 5500;

Email: hr.applications@dcu.ie

Dublin City University is an equal opportunities employer