



Research Centre

Insight Centre for Data Analytics

Post title

Post-Doctoral Researcher in Body Sensor Network for Motion Capture and Analysis

Level on Framework

Level 1

Post duration

One Year

Research Career Framework

As part of this role the researcher will be required to participate in the DCU Research Career Framework <http://www.dcu.ie/hr/ResearchersFramework/index.shtml>. This framework is designed to provide significant professional development opportunities to Researchers and offer the best opportunities in terms of a wider career path.

Background:

The Insight Centre for Data Analytics (<http://www.Insight-centre.org>) is a joint initiative between researchers at University College Dublin, NUI Galway, University College Cork, and Dublin City University, as well as other partner institutions. It brings together a critical mass of more than 350 researchers from Ireland's leading ICT centers to develop a new generation of data analytics technologies in a number of key application areas. The €88m centre is funded by Science Foundation Ireland and a wide range of industry partners. Insight's research focus encompasses a broad range of data analytics technologies from machine learning, decision analytics and social network analysis to linked data, recommender systems and the sensor web. Together, with more than 30 partner companies, Insight researchers are solving critical challenges in the areas of Connected Health and the Discovery Economy.

The Project:

Wearable technologies have been identified as the next great challenge in the Data Analytics revolution presenting the challenge not only of extracting useful information from large amounts of raw data, but of doing so in real-time in order to provide timely contextual feedback. This project presents an opportunity to proactively translate research expertise of networked wearable inertial sensors and pervasive computing, combined with a deep understanding of sports biomechanics, into a commercially relevant technology platform for sports performance. The focus of this project is to use off-the-shelf inertial sensors and develop a platform using wearable inertial sensors to monitor a tennis player's technique to provide real time feedback on a tennis court for both enhancing performance and preventing/managing injury.

Principle Duties and Responsibilities

The position will involve working on providing a light weight, portable, easy to use and low-cost solution that can be utilized by tennis players at all levels to obtain meaningful information about the tennis serve actions outside of the laboratory setting that provides audio-visual feedback in real-time.

Reporting to his/her Principal Investigator the Post-Doctoral Researcher will:

- Designing and implementing a technology platform to:
 - Measure and visualize the swing and the racket (i.e. orientation, velocity and position (trajectory) of the racket head in 3-D space) during the entire action;
 - Automatically identify different phases of a swing (i.e. backswing, forward swing, follow through);
 - Visualize the analyses of the Kinematic/Kinetic measures (e.g. elbow/knee joint angles, upper arm internal rotation, trunk rotation etc.) on a screen during the functional phases of the swing;
 - Provide semantic visual feedback in order to correct a player's action;
 - Allow "technique targets" to be set to provide real-time auditory feedback on every stroke via wireless earphones if the "technique target" is (not) achieved.
 - The successful candidate will work closely with other researchers at Insight DCU and with industry partners to address the above questions.
- Produce top-quality journal and conference publications, in collaboration with the Principal Investigator (PI).
- Participate in Insight Centre activities, such as industry showcases and annual reviews.
- Provide support and advice to PhD students working on similar topics.
- Assist in identifying and developing future research and funding initiatives.
- Engage in the dissemination of the results of the research in which he/she is engaged with the support of and under the supervision of the PI.
- Engage in appropriate training and development opportunities as required by the PI, the School or Research Centre, or the University.
- Carry out administrative work associated with the programme of research as necessary.

Minimum Criteria

Candidates should hold a PhD in Electronic Engineering, Computer Science or associated field, with experience of working with inertial sensors. (Note: we will be using off-the-shelf units and not developing our own). Prior experience of body sensor networks would be a distinct advantage. The following skills are required for this position:

- Fluent in programming (C# , MATLAB)
- Experience in using Unity
- Experience in the area of signal processing with strong mathematical ability
- Experience in the area of machine learning
- Experience in the area of data analysis

Salary: €37,750 - €40,003

Appointment will be commensurate with qualifications and experience.

Closing date: Friday 10th July, 2015

Candidates will be assessed on the following competencies:

Discipline knowledge and Research skills – Demonstrates knowledge of a research discipline and the ability to conduct a specific programme of research within that discipline and in collaboration with industry partners.

Understanding the Research Environment – Demonstrates an awareness of the research environment (for example funding bodies and key industry players) and the ability to contribute to grant applications

Communicating Research – Demonstrates the ability to communicate their research with their peers, with industry partners, and with the wider research community (for example presenting at conferences and publishing research in relevant journals) and the potential to teach and tutor students

Managing & Leadership skills - Demonstrates the potential to manage a research project including the supervision of undergraduate students and to meet industry partner expectations regarding project turn-around times.

Application Procedure

Informal enquiries to:

Dr Amin Ahmadi, Insight Centre Data, Dublin City University amin.ahmadi@dcu.ie with
Email: amin.ahmadi@dcu.ie

Please do not send applications to this email address, instead apply as described below.

Application forms are available from the DCU Current Vacancies (open Competitions) website at <http://www.dcu.ie/vacancies/current.shtml> and also from the Human Resources Department, Dublin City University, Dublin 9. Tel: +353 (0) 1 7005149.

Please clearly state the role that you are applying for in your application and email subject line: Job Ref 108: Post-Doctoral Researcher in Body Sensor Network for Motion Capture and Analysis

Applications should be submitted by email to hr.applications@dcu.ie or by Fax: +353 (0)1 7005500 or by post to the Human Resources Department, Dublin City University, Dublin 9. Human Resources Department, Dublin City University, Dublin 9. Tel: +353 1 700 5149; Fax: +353 1 700 5500 Email: hr.applications@dcu.ie

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