Research Centre

Insight Centre for Data Analytics

Post title

Post-Doctoral Researcher

Movement Biomechanics using Inertial Sensors

Level on Research Careers Framework

Level 1

Post duration

2 years

Research Career Framework

As part of this role the researcher will be required to participate in the DCU Research Career Framework. This framework is designed to provide significant professional development opportunities to Researchers and offer the best opportunities in terms of a wider career path. [http://www4.dcu.ie/hr/ResearchersFramework/index.shtml](http://www4.dcu.ie/hr/ResearchersFramework/index.shtml)

Background & Role

This project is a collaboration between the Sport Surgery Clinic, Dublin, INSIGHT Centre for Data Analytics, Dublin City University, and the School of Health and Human Performance, Dublin City University.

Lower limb injuries (including ACL and groin) are very common and require exercise-based rehabilitation. It is not feasible for the physiotherapist to watch the patient exercising on an ongoing basis to evaluate if they are doing the exercises, if they are doing them correctly, to determine when their exercises should change and when they are ready to return to play. In collaboration with experts in the field of rehabilitation (Sport Surgery Clinic) we (Insight) propose the development of a wearable sensor based analysis and feedback system to facilitate this. The system will primarily use inertial sensors (and possibly the MicroSoft Kinect) to track patient movements during the prescribed exercises, in order to provide feedback to the patient and the physiotherapist. This Postdoctoral position is focused on developing and implementing the algorithms to track lower body motion accurately, real-time analytics to compare the patient’s movement technique to a gold standard, real-time feedback to the patient, and summary information to the clinician.

Sports Surgery Clinic:

The Sports Surgery Clinic is Ireland's leading private Orthopaedic and Sports Medicine Hospital. The Sports Medicine department is at the forefront of clinical and applied research in the field of Athletic groin and anterior cruciate ligament injury and pain. The SSC has recently opened a purpose build 3D motion capture laboratory with indoor turf floor to assess athletic groin pain and ACL injury. The laboratory sees over 500 Post ACL reconstruction patients and 800 athletic groin pain patients each year.
INSIGHT

The INSIGHT Research Centre for Big Data Analytics is a joint initiative between researchers at Dublin City University, University College Dublin, NUI Galway and University College Cork, as well as other partner institutions. It will bring together a critical mass of more than 200 researchers from Ireland's leading ICT centers to develop a new generation of data analytics technologies in a number of key application areas.

The €80m center 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 and challenges, from machine learning, decision analytics and social network analysis to linked data, recommender systems and the sensor web. And together with more than 30 partner companies INSIGHT researchers are solving critical challenges in the areas of Connected Health and the Discovery Economy. The Discovery Economy refers to novel products and services based on a better understanding of short and long-term user needs. It combines ideas from personalization and recommender systems with location-based services and the real-time social web. Connected Health advocates a technology-based model for healthcare delivery to maximize healthcare resources and provide increased, flexible opportunities for people to engage with clinicians and better self-manage their own care.

School of Health and Human Performance

Research is a priority within the School of Health and Human Performance. The School aims to bring together multi-disciplinary researchers to address significant topics related to physical activity, sport and health. It has a significant national and international research reputation with state-of-the-art facilities and resources. The biomechanics research group is led by Dr. Kieran Moran (www.linkedin.com/in/kieranmorandcu).

Principal Duties and Responsibilities:

Reporting to his/her Principal Investigator, the Postdoctoral Researcher will:

- Use wireless inertial sensors to develop a system to measure the movement biomechanics of patients outside of the biomechanics lab whilst they are rehabilitating from groin and ACL injuries.
- Support the analysis of biomechanical data and the development/improvement of programs to enhance the speed at which data is processed from the current cameras based motion analysis system (Vicon).
- Liaise with the Sport Surgery Clinic and both internal and external partners/collaborators
- 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 Principal Investigator(s).
- Supervise and assist undergraduate students working in related research areas.
- Engage in appropriate training and development opportunities as required by the Principal Investigator(s) or the Sport Surgery Clinic.
- Engage in teaching and teaching support as assigned by the Head of School under the direction of the Principal Investigator(s)
- Carry out administrative work associated with the programme of research as necessary, and any other roles identified by the Principal Investigator(s)
Experience and Qualifications
Candidates should hold a PhD in Electronic Engineering or associated field, with experience of working with inertial sensors. (Note: we will be using off-the-shelf units and not developing our own). Additional experience in the area of data analysis would be advantageous. Excellent communication and interpersonal skills are also required.

Salary: €37,750 - €46,255*

*Appointment will be commensurate with qualifications and experience.

Closing Date: 5th May 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.

- **Understanding the Research Environment** – Demonstrates an awareness of the research environment (for example funding bodies) and the ability to contribute to grant applications.

- **Communicating Research** – Demonstrates the ability to communicate their research with their peers and 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 projects including the supervision of undergraduate students.

Application Procedure

Informal enquiries to:
Dr Kieran Moran, XG05, School of Health and Human Performance, Dublin City University, Dublin 9, Ireland. Phone: 00353 1 700 8011, E-mail: Kieran.moran@dcu.ie (www.linkedin.com/in/kieranmorandcu).

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 #56: Postdoctoral Researcher L1 Movement Biomechanics using Inertial Sensors

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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