PhD researcher – SimuLimb: Computational Design and Evaluation of Prosthetic Sockets for Lower Limb Amputees

Science & Engineering, Engineering, Mechanical Engineering

Applications are invited from suitably qualified candidates for a full-time fixed term position as a PhD researcher with the Mechanical Engineering department of the University of Galway.

This position is funded through the Science Foundation Ireland (SFI) research centre LERO, and is available from 01/09/2022 to the contract end date of 31/08/2026 (or 4 years from the start).

This position is part of the SimuLimb project, which aims to create, deploy, and clinically evaluate, an open source experimental and computational framework for automated prosthetic socket design. The project features the acquisition of clinical data, such as limb shape and tissue mechanical properties, and to use this data in a computational framework for socket design. Next sockets are 3D printed and tested and clinically evaluated.

Job Description:
The successful candidate will work within the SimuLimb project and focus on the computational and experimental methods for automated and optimised prosthetic socket design. The experimental data acquisition includes the use of a 3D digital image correlation system to capture limb shape and tissue deformation. These measurements are next used in an automated process to design and evaluate subject-specific prosthetic sockets. The successful candidate will work to expand the software framework with topology optimisation, to enable the creation of optimally fitting sockets that are comfortable and prevent tissue injury. Finally the designs are 3D printed and tested with volunteer patients with our prosthetic clinic partners APOS (https://www.apos.ie/).

Duties:
- To use and improve an existing open hardware system for limb shape and deformation imaging based on a circular configuration of Raspberry Pi cameras.
- To use and improve open source software system for computational design of prosthetic sockets.
- Work with clinicians to deploy and evaluate the imaging system and the design software, for use in a clinical setting
- To 3D print prosthetic sockets and to evaluate them with a patient cohort.
- Publication of scientific outputs such as: research articles, open data, open source software, and open hardware.
- Actively participate in national/international conferences and meetings

Qualifications/Skills required:

Essential Requirements:
- A strong commitment to principals of open science
- A primary degree in Biomedical Engineering, Mechanical Engineering, Electrical Engineering, or a closely-related discipline.
- Experience with programming languages such as MATLAB, Python, and Julia.
- Excellent communication and organizational skills.

Desirable Requirements:
- Experience with finite element analysis and computational biomechanics
- Experience with Computer Aided Design (CAD) software
- Experience with 3D printing
- Experience with Raspberry Pi and/or Arduino, and other embedded electronics and sensor systems
- Experience in open source software development
- Experience with the Julia programming language
- Experience with the Ubuntu operating system

Salary: €18500 per annum (SFI recommended PhD salary)

Start date: Position is available from September 2022

Continuing Professional Development/Training:
Researchers at the University of Galway are encouraged to avail of a range of training and development opportunities designed to support their personal career development plans.

Further information on research and working at the University of Galway is available on Research at the University of Galway

For information on moving to Ireland please see www.euraxess.ie

Informal enquiries concerning the post may be made to Dr Kevin Moerman (kevin.moerman@universityofgalway.ie).

To Apply:
In order to apply please ubmit a cover letter, a CV, and the contact details of three referees. All documents should be sent in PDF format only to: **Dr Kevin Moerman**, kevin.moerman@universityofgalway.ie.

Closing date for receipt of applications is 5.00 pm 16/09/2022

Optional: Interviews are planned to be held between 19/09/2022 and 23/09/2022

We reserve the right to re-advertise or extend the closing date for this post.

The University of Galway is an equal opportunities employer.

All positions are recruited in line with Open, Transparent, Merit (OTM) and Competency based recruitment.

The University of Galway provides continuing professional development supports for all researchers seeking to build their own career pathways either within or beyond academia. Researchers are encouraged to engage with our Researcher Development Centre (RDC) upon commencing employment - see https://www.universityofgalway.ie/rdc/ for further information.

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