2x PhD studentships in Rehabilitation & Assistive Robotics

Two 3-year PhD studentships are available in the UCL’s Aspire CREATE Centre for Rehabilitation Engineering and Assistive Technology (Aspire CREATE). Aspire CREATE is part of UCL Faculty of Medical Sciences and UCL Faculty of Engineering 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 and join a team of researchers at the Aspire CREATE centre, the London Spinal Cord Injury Centre (LSCIC), and the Peripheral Nerve Injury Unit (PNI) at the Royal National Orthopaedic Hospital (RNOH). The studentship will be based at the UCL/RNOH Stanmore campus.

The studentships are available for immediate start and will cover each a tax-free stipend between £16,504 and £17,160 per annum (subject to nationality and residence status) and tuition fees (for UK/EU students only).

**Studentship 1 (GRASP)**
This studentship focuses on the design and development of a grasp exoskeleton for assisting SCI patients in ADL tasks. We are interested in exploring soft robotics design techniques to achieve a highly versatile device that could potentially assist SCI individuals with limited hand function while manipulating objects and executing ADLs (e.g. drinking, eating). We envision a device that will be easy to use, low-cost and double up as a rehabilitation device with translation to other populations (e.g. brain and nerve injuries). The work will include mechatronic design and real-time control of robotic components, running experiments (validation), recording, analysing, presenting and writing up the results.

**Studentship 2 (Proprioception)**
This studentship focuses on the investigation of the role of proprioception and embodiment in neuropathic pain with application to SCI, brain & nerve injuries and following amputation. The feeling of body ownership arises as a result of the integration of multisensory information arriving at the central nervous system from the periphery. These integrative processes are effortless and automatic, so that body ownership (identification with one’s biological body) and agency (identification as the agent of willful actions) blend in our everyday feeling of self. We are interested in developing multi-modal techniques that explore tactile search and use non-invasive interfacing methods to enhance proprioception (e.g. mimic mechanoreceptors' input through vibrotactile stimulation) by facilitating afferent sensory information through the peripheral nervous system to the brain. The work could take a focus on the use multi-modal robotic systems such as our ROBIN system or be applied to the design of low-cost bionic limbs.

**Person Specification**

**Essential:**
- Bachelor degree in Engineering or Physics discipline, or equivalent professional experience
- Proven experience in mechatronic engineering or robotics
- Experience in mechanical design/mechanism analysis (including multibody simulation and robot dynamics and control)
- Knowledge of design software tools such as SolidWorks, MATLAB/Simulink, C#/C++
• Demonstration of experimental experience in muscle electrophysiology and biomechanics (specifically of the hand)
• Analytical skills: ability to interpret data, knowledge of statistics and ability to think independently
• Strong verbal and written communication skills, both in plain English for dialogue with patients (see http://www.plainenglish.co.uk/), and scientific language for communication with medical and academic staff, publication in relevant journals and presentation at conferences.

Desirable:
• Competency in interfacing sensors and actuators with embedded systems using microcontrollers (e.g. PIC/Arduino)
• Industrial design experience in robotics, sensors and actuators or other relevant fields
• Experience with low power electronic instrumentation.
• Experience in designing Human Machine Interactions
• Proven ability and commitment to carry out high quality original research in a research environment
• Experience of clinical research and/or experiments with human participants
• Experience of machine learning techniques
• Knowledge of Neuroscience
• Flexible, able to work collaboratively
• A strong team player with good interpersonal skills able to build and sustain effective working relationships with both the CREATe team, the LSCIC and PNI teams
• Self-motivated researcher, with a hands-on approach, willing to develop their technical and analytical skills and contribute to the overall aims of the research project in innovative ways
• Proven organizational skills

Eligibility
The studentship covers the fees for UK/EU students only. Additional fees may be required for students applying who do not fulfill UCL’s criteria to be considered a home student. Please check the UCL website for full criteria at http://www.ucl.ac.uk/current-students/money/fees-support/fee_status_proc

Application
To make an application please submit a 2-page CV with a cover letter, explaining your motivation for applying, interests, engineering and research experience (including examples of previous project work) to Dr Rui Loureiro – r.loureiro@ucl.ac.uk

In your email please use the subject line:
“Grasp PhD Studentship” for studentship 1,
“Proprioception PhD Studentship” for studentship 2

Application Closing Date
Friday 3rd September 2017

Interview Date
Monday 11th September 2017
Interviews will be conducted either in person at the RNOH (UCL Stanmore campus), or via Skype.

Studentship Start Date
Immediate start possible preferably not later than Monday 2nd October 2017

Please note that we can only guarantee to contact the shortlisted candidates.