PhD Studentship: Digital Manufacturing of Wearable Sensors and Soft Robots

The Integrated Soft Machines Lab in the Institute of Mechanical, Process and Energy Engineering (IMPEE) at Heriot-Watt University is offering a 3-year fully funded PhD studentship to explore digitally manufactured wearable sensors and soft robots.

In the last decade, extensive research has been conducted on flexible sensors and actuators as they have significant potentials in healthcare monitoring and soft robotics. Remarkable advances in materials science, nanotechnology, and biotechnology have led to the development of various wearable sensors (e.g., strain, pressure, temperature, pH, and glucose sensors) and biomimetic soft actuators. Recently, intensive research activities have focused on the development of multiplexed electronic skins capable of selective and simultaneous assessment of multiple physical, chemical, and/or biological signs. Despite significant progress in this field, it is still a grand challenge to develop integrated and multifunctional soft systems capable of simultaneous sensation, data collection and signal processing, and controlled actuation or stimulation, largely due to the manufacturing complexity.

This PhD project aims to address this limitation utilizing digital manufacturing technologies including 3D printing and laser micromachining. The fabrication process involves incorporation of micro/nanoscale functional materials (e.g., carbon nanotubes, nanowires, and graphene) into stretchable polymers and stimuli-responsive materials in the form of nanocomposites, and subsequent patterning/printing through computer-aided designs. The project further focuses on the possible integration of flexible sensors/actuators with mobile-based platforms and bioinspired skin adhesive films. This is an exciting opportunity to work on a dynamic and interdisciplinary research topic that intertwines engineering, materials science, and healthcare technology. For further information about our research, please visit [https://www.hw.ac.uk/staff/uk/eps/MortezaAmjadi_Profile.htm](https://www.hw.ac.uk/staff/uk/eps/MortezaAmjadi_Profile.htm).

**Candidate Requirements**

We are looking for a talented and highly motivated PhD student holding (or close to completing) a master’s degree (or international equivalent) in Mechanical Engineering, Materials Science, and Electrical Engineering, or a relevant discipline. Applicants with an interest in smart materials, soft robotics, bioelectronics, digital manufacturing, and wearable technologies are particularly encouraged to apply.

**Application Details**

Prior to application, please send your CV and transcripts along with a cover letter describing your interest and relevant experience to Dr Morteza Amjadi at m.amjadi@hw.ac.uk.

To apply for this studentship, please submit your PhD application through the Heriot-Watt on-line system [https://hwacuk.elluciancrmrecruit.com/Admissions/Pages/Login.aspx](https://hwacuk.elluciancrmrecruit.com/Admissions/Pages/Login.aspx), providing the title of the project, the name of the supervisor, and supporting documents. The application deadline is 31 January 2020.

This project is available to UK/EU applicants only. The annual stipend will be approx. £14,777 and tuition fees will be fully covered.