



1 Advertisement

Post Title: Research Fellow in Wearable Technologies

School/department: School of Engineering and Informatics - Department of Engineering and Design - Sensor Technology Research Centre

Hours: full time or part time hours considered up to a maximum of 1 FTE

Requests for flexible working options will be considered (subject to business need).

Contract: fixed term for 12 months

Reference: 8444

Salary: starting at £34,304 to £40,927 per annum, pro rata if part time

Placed on: 11 April 2022

Closing date: 17 May 2022. Applications must be received by midnight of the closing date.

Expected Interview date: tbc

Expected start date: asap

- The Sensor Technology Research Centre at the University of Sussex is looking for a researcher to work on a research-intensive industry funded project on the development of novel tools for shape sensing.
- This project aims to develop a textile sleeve with an integrated array of stretchable sensors. The goal is to dynamically quantify the shape of the body parts covered with the textile sleeve, and hence to offer a digital alternative to traditional plaster cast moulds.
- Your role will be to create an algorithm and associated software to reconstruct the sleeve shape based on the stretch and bend sensor readings, and to develop a reconstruction algorithm, for example based on minimizing an energy function.
- You will also visualize the 3D shape derived from sensor data in an intuitive way.
- In addition, you should be able to interact with hardware engineers to define with them an experimental protocol to obtain the sensor readings for particular sleeve deformations, in order to verify the reconstruction method.
- The project will be realized in close collaboration with two other researchers, responsible for the textile integration, and the sensor development, respectively.

Key Requirements. This post is well suited to a highly motivated individual with excellent software programming skills, creativity, and a willingness to operate in a dynamic research environment within an international team.

Candidates should have a MSc or PhD degree in computer science, computer engineering, electrical engineering, mathematic, physics, or equivalent, with as a key requirement strong programming expertise.

Important is shape deformation simulation using software libraries (e.g. an existing code base is available in Matlab and Python using PyChrono), mathematical modelling applied to physical/mechanical or equivalent systems, mathematical formulation of optimisation problems and their resolution through gradient descent and other optimisation algorithms,

graphical visualisation, sensitivity analysis, etc.

An established expertise in the application of research outcomes in the healthcare sector is desirable. The candidate should have a strong interest in the development and fabrication of novel electronics and their unobtrusive integration into body worn devices.

Background. The Sensor Technology Research Centre at the University of Sussex works on the interface between engineering, computer science, and physics to develop innovative sensor systems for applications in sports, healthcare, or wearable electronics.

Advantages and career development. This position is ideally suited for somebody who wants to broaden his/her knowledge on the application of sensors in wearable and flexible electronics to support patients and professionals in the healthcare sector. It is an ideal opportunity to work on a project with a direct link to a local industrial healthcare company.

Please contact Daniel Roggen (d.roggen@sussex.ac.uk) or Niko Münzenrieder (n.s.munzenrieder@sussex.ac.uk) for informal enquiries.

The University is committed to equality and valuing diversity, and applications are particularly welcomed from women and black and minority ethnic candidates, who are under-represented in academic posts in Science, Technology, Engineering, Medicine and Mathematics (STEMM) at Sussex.

Please note that this position may be subject to [ATAS clearance](#) if you require visa sponsorship.

For full details and how to apply see our [vacancies page](#)

The University of Sussex values the diversity of its staff and students and we welcome applicants from all backgrounds.

2. The School / Division

Please find further information regarding the school/division at www.sussex.ac.uk/engineering

3. Job Description

Job Description for the post of: Research Fellow in Wearable Technologies

Department: Department of Engineering and Design

Section/Unit/School: School of Engineering and Informatics

Location: Sensor Technology Research Centre

Grade: 7.1

Responsible to: Principal Investigator through to Head of School

KEY RESPONSIBILITIES

1. Research, Scholarship & Enterprise

- 1.1 Contribute to research projects in collaboration with others.
- 1.2 Analyse and interpret findings and draw conclusions on the outcomes.
- 1.3 Individually or with colleagues, explore opportunities for enterprise activity, knowledge exchange income and/or consultancy, where permissible.
- 1.4 Build internal contacts and participate in internal networks and relevant external networks in order to form relationships and collaborations.
- 1.5 Continually update knowledge and understanding in field or specialism and engage in continuous professional development.

2. Teaching & Student Support

- 2.1 Undertake teaching duties, if required.
- 2.2 Assist in the assessment of student knowledge and supervision of student projects if required.

3. Contribution to School & University

- 3.1 Attend and contribute to relevant School and project meetings.
- 3.2 Undertake additional duties, as required by the Principal Investigator and/or Head of School.

4. Role-specific duties

- 4.1 Development of a shape deformation simulation software allowing to read the data of simulated bend and stretch sensors, including their imperfections (e.g. noise, non-linearities).
- 4.2 Development of a shape reconstruction method based on a mathematical model linking sleeve shape with sensor readings, which is amenable to resolution with optimisation techniques, or possibly machine learning techniques.
- 4.3 Evaluation of the reconstruction performance in comparison to simulation with a well selected set of target shapes allowing to emphasize strengths and weaknesses of the approach, as well as influence of virtual sensor parameters and other model parameters.
- 4.4 Evaluation of the reconstruction performance on the real hardware. This requires collaborating with the hardware research fellows to define a suitable test protocol (e.g. shapes, number of sensors and placement).
- 4.5 Graphical visualisation of the shape reconstruction.
- 4.6 Support a potential commercialization of the developed technologies.
- 4.7 Publish scientific results in high quality journals and present your work at international conferences.
- 4.8 Generate innovation ideas which may result in patents.
- 4.9 Exchange expertise with PhD students and colleagues.
- 4.10 Collaborate with the industrial partner, generate deliverables and reports and assist with flow of information among stakeholders.

This Job Description sets out current duties of the post that may vary from time to time without changing the general character of the post or level of responsibility entailed.

INDICATIVE PERFORMANCE CRITERIA

- An MSc or PhD (or being in the final phase of the PhD studies) in computer science, computer engineering, electronic engineering, mathematics, physics, or equivalent.
- Publishing research (either from a recently completed PhD or new original research).
- Published reviewed publications, and citation index.
- Other forms of externally recognised professional practice of creative output of a standing equivalent to regular publication of original research.
- Initiating, developing or participating in links between the University and external bodies such as business and industry, the professions, community organisations and policy-makers.

4. Person Specification

ESSENTIAL CRITERIA

1. Educated to MSc or doctoral level, or other equivalent qualification, as appropriate to the discipline (see role-specific criteria below).
2. Evidence of engagement in high-quality research activity.
3. Excellent presentation skills, with the ability to communicate effectively, both orally and in writing, with students, colleagues and external audiences.
4. Ability to work individually on own initiative and without close supervision, and as part of a team.
5. Ability to exercise a degree of innovation and creative problem-solving.
6. Excellent organisational and administrative skills.
7. Ability to prioritise and meet deadlines.
8. Excellent IT skills.

ESSENTIAL ROLE-SPECIFIC CRITERIA

- 1 A degree in computer science, computer engineering, electronics engineering, mathematics or physics.
- 2 Programming expertise in Python and Matlab to reuse the current code base, or other suitable languages (e.g. C++).
- 3 Ability to use third party libraries, such as physics engines (e.g. PyChrono), optimisation libraries, rendering libraries, data acquisition libraries, GUI libraries (e.g. Qt).
- 4 Programming expertise of 3D graphical visualisation.
- 5 Ability to mathematically model physical systems.
- 6 Ability to solve optimisation problems.
- 7 Experience of writing high-quality technical reports and publications.
- 8 Ability to interact with other research fellows within the project.
- 9 Ability to work independently and creatively within a team and meet deadlines.

DESIRABLE CRITERIA

1. Experience of generating research or knowledge exchange income.
2. Interest in wearable technologies and human activity sensing
3. Experience in machine learning.
4. Experience with embedded systems, notably data acquisition, to collaborate with the hardware research fellows.