UNIVERSITY OF SUSSEX

1 Advertisement

Post Title: Research Fellow in Interactive Graphics
School/department: School of Engineering and Informatics
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 18 months
Reference: 2326
Salary: starting at £33,797 and rising to £40,322 per annum, pro rata
Placed on: 16 September 2019
Closing date: 15 October 2019. Applications must be received by midnight of the closing date.
Expected start date: October 2019 or soon after

We are looking for a Research Fellow (post-doctoral researcher) to join the Interact lab at the School of Engineering and Informatics of the University of Sussex, to assist in the development of novel interactions using manipulation of electro acoustic waves.

This is an ERC Advanced project exploring new forms of wavefront manipulation combining fabrication and phased arrays.

The primary goal of this project is to apply the principles of wavefront manipulation and metamaterials to explore a combination of acoustic levitation, mid-air haptics and parametric audio to create dynamic 3D physical shapes made of large collections of lightweight levitating objects that support haptic feedback and directional audio. This will also allow us to explore its potential for human computer interaction and the creation of novel user experiences.

The Interact Lab is at the forefront of this research and has already published several articles on this topic. Some example videos highlighting our research can be seen at

- https://www.youtube.com/watch?v=BcVxRyvipcU

  And

- https://www.youtube.com/watch?v=U-wAGqZ_Qcg

Within this project, the Research Fellow will be expected to

1. Use various techniques (i.e. linear algebra, GPU programming, computer vision/computer graphics) to control devices to create new user experiences that are based on wavefront manipulation
2. Develop and implement the principles of how to create haptics, directional audio and/or levitation systems based on the sculpting of different electro-acoustic fields.
3. Identify interaction design principles and visualisation techniques that can support users in their interactions with this new technology.

The position will involve a variety of tasks such as the design and implementation of algorithms for levitation, and/or pair-wise combinations of levitation, haptics and directional audio; implement interaction techniques; conduct user-studies to identify interaction

principles and publishing these results in scientific venues. The applicant will also be expected to help in the teaching of related units.

The position would be suitable for someone with experience on technical aspects of one or more of the following areas

a) human-computer interaction (i.e. audio processing, interactive graphics, augmented reality systems and levitation),

b) computer graphics/ computational acoustics

c) Machine learning with interest in its applications to hci/ graphics.

Some previous experience with electronics and using maker space tools (e.g. laser cutters, 3D printers) will be positively appreciated.

The research fellow will have considerable freedom in shaping the nature of the research project. So we seek a highly organised and motivated individual able to multi-task and work independently with minimal supervision while maintaining excellent attention to detail and bring energy and enthusiasm to a vibrant research group. Excellent written and communication skills are also essential.

The Interact Lab is internationally renowned for it research in creating novel interactive devices for enabling new forms of human-computer interaction (HCI). HCI is about applying human abilities to the design of tools, systems, and environments that are safe, effective and comfortable for use.

The lab consists of three permanent members of staff led by Prof. Subramanian. Alongside these staff members it currently hosts four post-doctoral researchers, 7 PhD students and several visiting researchers. The work of lab members often attracts media attention and offers many public engagement opportunities. One of our successful lines of research is in the field of mid-air haptics and we would draw on our expertise in this topic to propel this area of acoustic levitation.

Employment will be subject to the right to work in the UK. You will work directly with Prof. Sriram Subramanian, with a base in the Department of Informatics. You can find more information about the group at www.interact-lab.com

For informal inquiries please contact Prof. Subramanian, Department of Informatics, University of Sussex, Falmer, Brighton BN1 9QJ, UK; sriram@sussex.ac.uk.

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

The School of Engineering and Informatics covers the disciplines of computer, electrical and electronic engineering, mechanical, and automotive engineering, product design, digital media, computer science and informatics.

Distinctive characteristics of the School are: creativity, interdisciplinarity, strong links with industry, and an international outlook in both research and teaching. £10m (£4.9m from HEFCE) is being invested in a new Computing, Robotics, Electronics and Mechatronics Centre (CREaM) as a result of a 60% surge in applications for the School's degrees.

The School offers a range of undergraduate and postgraduate degrees in its areas of expertise, often in collaboration with other schools at Sussex, to create a distinctive focus

that addresses the needs of industry, commerce and society. Examples include joint degrees with the MSc in Evolutionary and Adaptive Systems (EASy) that includes modules from the Schools of Engineering and Informatics and Psychology; and the MScs in Engineering Business Management, and Management of Information Technology, which were developed in collaboration with the School of Business, Management and Economics.

This interdisciplinary approach also applies to our research, with current and recent externally funded projects with researchers in a wide range of other subject areas including: geomorphology, media practice, medical imaging, neuroscience, anthropology, English literature, epidemiology, geography, international development, mathematics, psychiatry, psychology and sociology.

The School has strong links with industry, and has an established Strategic Advisory Board.

Innovative research across the School has led to a number of patents which are being commercialised including: novel electric potential sensors (EPS) licensed to Plessey Semiconductors and marketed as the EPIC sensor chip; and University spin-out companies, including TribeHive, which is deploying delay-tolerant networking to provide smartphone connectivity in large crowds, and TexRAD, which has developed software for the analysis of medical images and has recently demonstrated the ability to detect brain texture anomalies in Asperger's Syndrome patients. These developments have been supported by the University's Enterprise fund. The EPS sensor technology was awarded the IET Innovation award for 'Measurement in Action', and was shortlisted for two other IET categories and for a THES award.

The School is, for administrative purposes, comprised of two departments: the *Department of Engineering and Design*, and the *Department of Informatics*. Staff teach across the School, and undertake research on cross-School, as well as cross-University projects.

The Department
The Department of Informatics is highly rated for its teaching and research. Its researchers work in an environment that was deemed to be wholly 4*/3* (world-leading/ internationally excellent) in the REF 2014.

Sussex was ranked in the top 25 in the UK in The Guardian University Guide 2014. Our students are highly employable: in early 2014, 95% of our previous year's graduates were employed, and of those, 100% were in professional or managerial jobs.

The Department maintains a strong emphasis on interdisciplinary teaching and research, and has substantive links with almost all other Schools of study at Sussex. Its research spans the theoretical and applied.

The Department's research is organised into four groups:

- Cognitive and Language Processing Systems (www.sussex.ac.uk/calps/)
- Evolutionary and Adaptive Systems (www.sussex.ac.uk/easy/)
- Foundations of Software Systems (www.sussex.ac.uk/foss/)
- Creative Technologies Group (http://www.sussex.ac.uk/creativetechnology/),

and also plays leading roles in cross-disciplinary research centres:

- Sackler Centre for Consciousness Science (www.sussex.ac.uk/sackler/)
- Centre for Computational Neuroscience and Robotics (CCNR) (www.sussex.ac.uk/ccnr/)
- Centre for Cognitive Science (COGS) (www.sussex.ac.uk/cogs/)
- Sussex Neuroscience (www.sussex.ac.uk/sussexneuroscience/).

The Department has long-standing collaborations with a range of external organisations including Animazoo, the Clinical Practice Research Datalink, and American Express, which has sponsored over 120 MSc students in Informatics over the past 10 years.

The Department currently has 33 teaching faculty, 420 undergraduates, 80 taught postgraduates, and 60 doctoral students. Detailed information about the Department can be found at www.sussex.ac.uk/informatics

3. Job Description

Job Description for the post of: Research Fellow in Interactive Graphics

Department: Informatics

Section/Unit/School: Engineering and Informatics

Location: University of Sussex, Falmer Campus

Grade:7.1

Responsible to: Sriram Subramanian

Responsible for: n/a.

Research Fellow I is an early career-grade research position. Post-holders will be expected to contribute to the work of the research team, and also to develop their research skills with support from more experienced members of staff.
This position in particular aims to assist in the development of novel techniques for acoustic wavefront manipulation, with applications in levitation, mid-air tactile feedback, parametric audio and combinations of these. The applicant will also explore the potential of these techniques for human computer interaction and the creation of novel user experiences.

4. Person Specification

ESSENTIAL CRITERIA

1. Normally educated to doctoral level, or other equivalent qualification, or appropriate level of experience, 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. Knowledge in computer vision/ computer graphics and GPU programming.
2. Strong mathematical background (linear algebra, vector analysis, complex numbers, regression approaches).
3. Programming experience with high performance, real time systems (C++, OpenGL, OpenCL, concurrency control, parallel programming).
4. Experience in working in human-computer interaction and/or interactive computer-graphics
5. Experience conducting experiments and/or user studies.

DESIRABLE CRITERIA

1. Emerging track record of high-quality publications in reputable journals and other appropriate media of similar standing.
2. Experience with computer vision/computer graphics.
3. Experience of generating research or knowledge exchange income.

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.