Post Title: Research Fellow  
School/department: School of Engineering and Informatics  
Hours: Full time. Requests for flexible working options will be considered (subject to business need).  
Contract: fixed term until 29 June 2021  
Reference: 2980  
Salary: starting at £33,797 and rising to £40,322 per annum  
Closing date: 14 February 2020. Applications must be received by midnight of the closing date.  
Expected Interview date: To be confirmed  
Expected start date: ASAP

We are inviting applications for one post-doctoral researcher to join the School of Engineering and Informatics of the University of Sussex, to assist in the development of novel, metamaterial-based devices to manipulate sound and ultrasound waves on demand. The post is funded by UK Research and Innovation (UKRI) and has sufficient resources to allow hardware prototyping and support conference travel.

You will be based in a newly-established multi-disciplinary research team, led by Dr. Gianluca Memoli and comprising of 4 members. Together we will be creating metamaterial-based devices to manage sound in different contexts. We will design the materials and assemble them in prototypes that will be tested on end users using VR/AR environments, in collaboration with our industrial partners (e.g. producers of videogames/3D video/VR content…but also musicians, architects and noise consultants).

Our team sits within the larger remit of the Interact Lab, a vibrant research environment currently including 3 academics, 4 post-doctoral researchers, 4 PhD students and several visiting researchers, from various backgrounds in computer science and engineering/physics. The work of lab members often attracts media attention and offers many public engagement opportunities.

The Interact Lab is internationally renowned for its research in creating novel interactive devices for human-computer interaction (HCI) and the basis on our research on metamaterials can be found described in this video: https://www.youtube.com/watch?v=BcVxRyvipcU
Within this project, the Research Fellow will have the chance to:

1. Design active, broadband devices to manipulate acoustic fields, with an acoustic function similar to the one autozoom cameras and LCD displays have for light;
2. Actuate the above mentioned systems using microfluidic techniques;
3. Use various techniques (e.g. the ones underpinning image compression and modern 3D displays) to develop acoustic devices that have no optical counterpart;
4. Develop and implement working prototypes based on the sculpting of different acoustic fields, to be tested in real applications, in collaboration with industrial partners;
5. Identify 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 construction of metamaterials, creation of working prototypes and publishing these results in scientific venues.

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

   a) Design of prototypes for human-computer interaction (HCI),
   b) Metamaterials in acoustics or related areas,
   c) Computational fabrication,
   d) Microfluidic actuation or acousto-fluidics.

Some previous experience with electronics and using maker space tools (e.g. laser cutters, 3D printers) and/or science outreach will be highly beneficial.

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 details. Excellent written and communication skills are also essential.

Employment will be subject to the right to work in the UK. You will work directly with Dr. Gianluca Memoli, with a base in the Department of Informatics. You can find more information about about the project at [http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/S001832/1](http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/S001832/1)

The School is committed to equality and valuing diversity, and currently holds an Athena SWAN Bronze Award. Applications are particularly welcomed from women and black and minority ethnic candidates, who are under-represented in academic posts in science and engineering at Sussex.

Enquiries
For informal enquiries, please contact Dr. Gianluca Memoli
(g.memoli@sussex.ac.uk,
+44 1273 678853)

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.*
Senior leadership and management

The Vice-Chancellor (Professor Adam Tickell) is the senior academic officer and, as Chief Executive, is responsible to the University Council for management of the University. He is supported by an executive group, which includes the Deputy Vice-Chancellor, the three Pro-Vice-Chancellors, the Chief Operating Officer, the Director of Finance and the Director of Human Resources. The Heads of the Schools of Studies at Sussex report to the Deputy Vice-Chancellor.

The Chief Operating Officer heads the Professional Services of the University. In addition, under the University Statutes, the Chief Operating Officer is Secretary to the University Council. The Director of Finance reports to the Vice-Chancellor, the Director of ITS and the Librarian report to the Chief Operating Officer.

3. The School of Engineering and Informatics

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.

Following a recent Professorial appointment, the School has just launched a major new School-wide research group in Creative Technology.

The Group brings together a number of academics working in the areas of human-centred technology, product design, experience design, tangible and physical computing, games, digital media, digital cultural heritage, child-computer interaction, broadcast technologies and social innovation.

3.1. Department of Engineering and Design

The Department of Engineering and Design has a strong reputation for excellence in research and teaching. Its research was highly rated in the 2008 RAE with 60% classed as world leading or internationally excellent. Sussex is ranked among the top 20 universities for mechanical engineering in the UK in The Guardian University Guide 2013 and The Sunday Times University Guide 2012, and among the top 20 universities in the UK for electrical and electronic engineering in The Times Good University Guide 2013 and The Sunday Times University Guide 2012. In the National Student Survey 2012, overall student satisfaction was typically over 90% reaching 97% on some courses. The Department’s students won two of the five Telegraph UK STEM Awards 2014: the automotive award sponsored by McLaren Group (link to video); and the environment award sponsored by SEMTA (link to video).

Research activity is focused on mechanical engineering (turbomachinery, dynamics and control (www.sussex.ac.uk/dcv), and tribology); and electronic engineering (sensor technology, image and signal processing, and mobile digital communications);. There is strong collaboration with industry, including Jaguar Land Rover, General Electric, Plessey Semiconductors and Meggitt Sensing Systems.

The Department currently has 26 teaching faculty, 538 undergraduate students, 59 taught postgraduate students, and 60 postgraduate research students. Undergraduate courses, accredited by the relevant professional institutions, include:

- MEng (Hons) / BEng (Hons) Automotive Engineering
- MEng (Hons) / BEng (Hons) Computer Engineering (a cross-School course between the Departments of Engineering and Design and the Department of Informatics)
- MEng (Hons) / BEng (Hons) Electrical and Electronic Engineering
- MEng (Hons) / BEng (Hons) Mechanical Engineering
- BSc (Hons) Product Design

all of which have an industrial placement year option.
The Department's Masters level courses, the majority of which are also accredited, are in the process of being reviewed as part of a cross-School process, the courses currently include:

- MSc Advanced Mechanical Engineering
- MSc Automotive Engineering
- MSc Digital Communication Systems
- MSc Digital Communication Systems with Business Management
- MSc Embedded Digital Systems
- MSc Engineering Business Management
- MSc Mechanical Engineering
- MSc Satellite Communication Systems

Detailed information about the Department can be found at [www.sussex.ac.uk/engineering](http://www.sussex.ac.uk/engineering)

### 3.2. Department of Informatics

The Department of Informatics is highly rated for its teaching and research. In the 2008 RAE, the Department was ranked in the top 15 in the subject nationally, with 70% of its research outputs classified as world-leading or internationally excellent. Sussex was ranked in the top 25 in the UK in The Guardian University Guide 2013 and The Times Good University Guide 2013. In the National Student Survey 2012, the students rated ‘staff as good at explaining things’ consistently over 80%, reaching 97%; with overall student satisfaction reaching 93%.

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, often crossing traditional discipline boundaries. The key research groups are Cognitive and Language Processing Systems, Evolutionary and Adaptive Systems, Foundations of Software Systems, and Creative Technology.

The Department plays leading roles in three cross-disciplinary research centres: the Sackler Centre for Consciousness; the Centre for Computational Neuroscience and Robotics (CCNR); and the Centre for Research in Cognitive Science (COGS). There is a long collaboration with external organisations including Animazoo; Vero Technologies; and American Express, which sponsors around 15 MSc students a year.

The Department currently has 27 teaching faculty, 340 undergraduates, 120 taught postgraduates and, 60 doctoral students. Undergraduate courses, accredited by the relevant professional institutions where appropriate, include:

- MComp (Hons) / BSc (Hons) Computer Science
- BSc (Hons) Computer Science and Artificial Intelligence
- BSc (Hons) Computing for Business and Management
- BSc (Hons) Computing for Digital Media
- BSc (Hons) Games and Multimedia Environments
- MEng (Hons) / BEng (Hons) Computer Engineering (*a cross-School course between the Department of Informatics and the Departments of Engineering and Design*)
all of which have a placement year option.

The Department’s Masters level courses are in the process of being reviewed as part of a cross-School process, the courses currently include:

- MSc Advanced Computer Science
- MSc Computing with Digital Media
- MSc Evolutionary and Adaptive Systems
- MSc Human-Computer Interaction
- MSc Information Technology with Business and Management
- MSc Intelligent Systems
- MSc Management of Information Technology

Detailed information about the Department can be found at [www.sussex.ac.uk/informatics](http://www.sussex.ac.uk/informatics)
Job Description

UNIVERSITY OF SUSSEX

Job Description for the post of: Research Fellow in Acoustic Metamaterials

Department Informatics
School Engineering and Informatics
Location University of Sussex
Grade Research Fellow I, Grade 7

Responsible to Dr. Gianluca Memoli

Responsible for None

We are looking for an enthusiastic and motivated research fellow, to contribute to the research of a newly-established research team led by Dr. Gianluca Memoli, within the larger remit of the Interact Lab (www.interact-lab.com).

In particular, our multi-disciplinary team will be exploring novel ways to control and interact with sound, both at audible and inaudible frequencies (ultrasound), in collaboration with industrial partners in Brighton and beyond. We will be designing and realising devices for on-demand manipulation of acoustic fields and sound cancellation, with a bandwidth of at least one octave. Prototype performance will be assessed during user studies, in real and virtual environments.

Post-holders will be expected to:
- engage in individual and/or collaborative research activities, resulting in high-quality publications;
- develop their research skills with support from more experienced members of staff;
- contribute to the development of research funding and knowledge exchange income individually or in collaboration with others, as appropriate, depending on the size and scope of the bid;
- participate actively in dissemination and outreach activities.

5. Principal accountabilities

- To engage in individual and/or collaborative research activity resulting in high-quality publications; and to develop research funding and knowledge exchange income individually or in collaboration with others, as appropriate, depending on the size and scope of the bid.
- To contribute to School teaching activities.
6. Key responsibilities

6.1 Research, Scholarship & Enterprise

- Develop research objectives and proposals for own or joint research, at acceptable levels, with assistance if required.
- Conduct research projects individually and in collaboration with others.
- Analyse and interpret research findings and draw conclusions on the outcomes.
- Produce high-quality research outputs for publication in monographs or recognised high-quality journals, or performance/exhibition, as appropriate, and contribute to the School’s REF submission at acceptable levels of volume and academic excellence.
- Contribute to the preparation of proposals and applications to external bodies, for example for funding purposes.
- Individually or with colleagues, explore opportunities for enterprise activity, knowledge exchange income and/or consultancy, where permissible.
- Build internal contacts and participate in internal networks and relevant external networks in order to form relationships and collaborations.
- Continually update knowledge and understanding in field or specialism, and engage in continuous professional development.

6.2 Teaching & Student Support

- Undertake teaching duties, if required.
- Assist in the assessment of student knowledge and supervision of student projects if required.
- Assist in the development of student research skills, for example as part of a postgraduate supervision team.

6.3 Contribution to School & University

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

6.4 Role-specific duties

- Develop required hardware and software tools to design, build and study metamaterial designs.
- Design and build interactive prototypes (using combinations of phased arrays and/or metamaterials) to demonstrate working prototypes of metamaterials.
- Characterize the potential benefits and limitations of the resulting systems through experiments, public demonstrations and user studies.
• Develop principles and visualisation techniques that facilitate user access to such systems.
• Write internal reports (i.e describing the results obtained) and scientific papers in high quality venues, such as SIGGRAPH, Nature or Science.

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. Training will be provided in those areas where the post-holder lacks experience.

7. **Person specification**

7.1. **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.

7.2. **Essential role-specific criteria**

1. Knowledge of optics, acoustic or audio signal processing.
2. Experience in building working and demonstrable prototypes
3. Experience with programming, e.g. in the solution of inverse optimisation problems
4. Experience in conducting experiments, gathering data and preparing manuscripts suitable for publication (either from a recent PhD or new original research).
5. Experience in disseminating results to non-technical audiences.

7.3. **Desirable role-specific criteria**

1. Emerging track record of high-quality publications in reputable journals and other appropriate media of similar standing.
2. Experience using maker space tools (i.e. 3D printers, laser cutters, Arduino, electronics, etc).
3. Programming experience with Unity/Unreal (i.e. C#, C++).
4. Experience of generating research or knowledge exchange income.
5. Experience with designing and conducting user studies to assess the validity of technical solutions.
6. Evidence of pursuing a line of independent research within a research group.
7. Other forms of externally recognised professional practice of creative output of a standing equivalent to regular publication of original research.
8. Evidence of participating in collaborations between academia and external bodies such as business and industry, the professions and policy-makers.
9. Evidence of successful engagement in teaching or supervision.

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.