Job Advert: Research Fellow in Digital Music Interaction

About this role

Applications are invited for the position of Research Fellow in Digital Music Interaction to create a new generation of accessible and expressive digital musical instruments.

You will design, develop, and evaluate novel music and human-computer interaction technologies that combine wearable motion capture technology and 3D prototyping. You will examine a range of design and fabrication approaches for physically prototyping tactile objects and develop algorithms for detecting interactions with these objects with hand-worn motion sensors. Additionally, you will develop and facilitate accessible user studies, workshops, and residencies to evaluate and co-design new interfaces with diverse participants, including Disabled musicians. You will publish your work at major music technology and human-computer interaction conferences and journals.

The successful candidate will be based in School of [Computing and Creative Technologies](#) at [The University of the West of England](#), Bristol. They will join the [Music Interaction and Computational Arts (MICA) Lab](#) working on the UK Research and Innovation (UKRI) funded Future Leaders Fellowship "Sensing Music Interactions from the Outside-In: Accessible Innovation Fusing Wearable Technology and Physical Prototyping". The project will examine technologies and methods to support the co-design and development of bespoke and accessible digital musical instruments. Project partners include [MiMU Gloves](#), [x-io Technologies](#), [Watershed](#), [Drake Music](#) and [Billy & Andy's Music School](#).

This is the first of two post-doctoral research roles; the second will be advertised in spring 2025.

About you

We seek applications from enthusiastic individuals who are strongly motivated to help push the boundaries of research and technology in music and human-computer interaction. You will have excellent technical skills

with research experience in one or more of the following areas: new interfaces for musical expression, human-computer interaction, sensor/signal processing and/or AI. Experience with creative 3D prototyping as well as designing and running accessible user studies, workshops and residencies to co-design and evaluate interactive systems is also desirable. You should have excellent communication skills, show a high level of initiative and be able to collaborate effectively with disabled and non-disabled colleagues and participants.

As a Research Fellow you will hold (or be close to completion of) a PhD in computer music, computer science, human-computer interaction, robotics, mechatronics, or other relevant field with a suitable publication track record. Equivalent knowledge and experience gained through alternative pathways is also welcomed.

The project and team are committed to meaningful improvement and change in terms of inclusion and accessibility. Diversity enhances research, and we welcome applications from those who will bring balance to our team, including those from communities who experience racism, sexism, ableism or any other barriers. The project includes collaborations with Disabled musicians, and we are led by the social model of disability. Consequently, Disabled researchers and those with lived experience of disability are encouraged to apply.

Candidates should be willing to occasionally work out of typical working hours (including weekends), for example to attend performances or demonstrations, and to travel both nationally and internationally to conduct research and attend conferences.

Where is this role based?

The post will be located within a multidisciplinary space called [The Bridge](#), which is a cutting-edge creative technology facility funded by the Arts and Humanities Research Council and the West of England Combined Authority. The Bridge is located on our lively [Frenchay](#) campus adjacent to the [Centre for Print Research](#) and [Bristol Robotics Laboratory](#).

[Why UWE Bristol?](#)

We are one of the largest providers of Higher Education in the South West with 38,000 students and 4,000 staff from right across the globe. Based in

Bristol, one of the UK's most exciting and forward-thinking cities, we are regionally embedded and globally connected, with an established network of employer and academic partners.

We offer a wide range of employee benefits including progressive pay rates, generous annual leave and career average pension schemes as well as retail savings, onsite nursery and opportunities for training, personal and professional development.

We also support access to work applications and will work flexibility to identify and remove disabling barriers.

Add your individuality to ours

UWE Bristol recognises the power of a truly diverse university community.

We are proud to be part of a vibrant, multicultural city that celebrates diversity, we're always looking for talented people from all backgrounds to join us. Our people are our strength, and diversity enhances our creativity and leads to better decision-making and problem-solving. Bring your talent and ambition to our growing community and find yourself in a stimulating and supportive environment where you'll thrive.

Further information

This is a 46 month (3 years 10 months) fixed-term post for just under four years and is full-time working on a 1.0 FTE contract.

This post is available on a job share basis for applicants wishing to work part time.

Interviews are scheduled to take place at our Frenchay Campus on the week commencing 10/06/2024.

For informal enquiries please contact Prof. Tom Mitchell on 0117 328 3349 or email: tom.mitchell@uwe.ac.uk.

UWE Bristol is a campus-based University and it is vital to our success and the delivery of an outstanding experience for our students that our campuses are dynamic and vibrant places to learn and spend time. This role is therefore campus based with options for hybrid and flexible working.

We may be able to sponsor qualifying candidates for this role under the Home Office Skilled Worker visa route. Please read our Skilled Worker

[Guidance](#) to assess if you will be eligible to be sponsored under the criteria.

Please also refer to the [Home Office Right to Work Checklist](#) which provides details of which documents are acceptable to prove your right to work in the UK. Should you be shortlisted you will be asked to produce your right to work documents at your interview.

Please note that UWE does not cover any visa or health surcharge costs.

Advice to applicants

If you would like to apply for this role please complete our application form as soon as possible.

Tell us about how your skills and experience relate to the requirements of this role by describing how you meet each of the essential and desirable criteria listed in the Person Specification section of the Job Description, and include specific examples wherever possible.

Once we have completed shortlisting we will let you know the outcome of your application by email, so please check your inbox for updates.

Job description

Post Title:	Research Fellow in Digital Music Interaction
Grade:	G
College:	CATE: College of Arts, Technology and Environment
Accountable to:	Project Principle Investigator (PI) - Prof. Tom Mitchell
Accountable for:	Day-to-day supervision of technical staff and co-supervision of doctoral students
Post no:	[Post Number]

Job context

This is a UKRI funded post is supported by the Future Leaders Fellowship: "Sensing Music Interactions from the Outside-In: Accessible Innovation Fusing Wearable Technology and Physical Prototyping".

The project goal is to develop technologies and methods that support the co-design and development of bespoke and accessible digital musical instruments. A novel interaction approach will be developed where technology worn on the hands will be used to sense a wearer's interactions with objects and mechanisms. The primary application is music, but the approach will be explored in wider domains of Human Computer Interaction.

This role is an opportunity to join a growing multidisciplinary team of researchers in the [Music Interaction and Computational Arts Lab (MICA Lab)](#) at UWE. The project partners include [MiMU Gloves](#), [x-io Technologies](#), [Watershed](#), [Drake Music](#) and [Billy & Andy's Music School](#).

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The post will be located within a multidisciplinary facility called The Bridge, which was funded by the Arts and Humanities Research Council and the West of England Combined Authority and located on our lively [Frenchay](#) campus adjacent to the [Centre for Print Research](#) and the [Bristol Robotics Laboratory](#). The post available on a full time or job share basis for applicants wishing to work part time.

Job purpose

The successful candidate will develop and conduct research individually or as part of a research team to investigate digital musical instruments and related technologies. They are also expected to design, develop, and conduct research studies with disabled and non-disabled participants from diverse backgrounds, and to disseminate findings to academic and non-academic audiences. Specifically, the research fellow will be closely involved in research on the work packages:

WP2 Sensing Musical Interactions with Wearable Technology
WP3: Advanced Manufacturing of Tactile Objects
WP4: Speculative Design Methods for End-User Instrument Development
WP5 Co-Designing Accessible Musical Instruments

Activities include:
- Creating algorithms for detecting nuanced musical interactions via hand worn wearable technology in real-time. This will involve aspects of signal processing, machine learning, AI and evaluating these techniques using quantitative methods.
- Designing, planning and running qualitative, reflexive, and mixed methods user studies with disabled and non-disabled participants from diverse backgrounds to evaluate the utility and accessibility of the developed technology. Activities will include workshops, case studies and long-term residencies.
- Exploring a range of methods for prototyping surfaces, objects, and mechanisms, that are designed to support interactions that can be detected via wearable technology. Prototyping methods might include 3D printing, laser cutting, CNC machining, swell touch printing combined with conductive materials and capacitive touch sensing.
- Designing and facilitating inclusive and speculative digital musical instrument co-design workshops and progressing designs into prototypes

that meet the aesthetic and access requirements of disabled and non-disabled musicians.

The role will include opportunities for professional development and training.

Principal accountabilities

1. ## Research and scholarship

   Develops research objectives and proposals for own or joint research, with the assistance of a mentor. Preparing and conducting, individual and collaborative research projects and writing up research work for publication.

   Uses initiative and creativity to identify areas for research, develops new research methods and extends the research portfolio. Translates advances in the subject area into research activity.

2. ## Workload and project planning

   Uses research resources, laboratories and workshops as appropriate to support research work. Plans and manages own research activity in collaboration with others. Responding to access requirements and making reasonable adjustments for collaborators and participants.

3. ## Communications

   Communicates complex information, including material of a specialist or highly technical nature. This may include writing and submitting publications, making presentations at conferences and presenting accessible information on progress and outcomes to stakeholders, e.g., team members, steering groups, and partners. Prepares proposals and applications to external bodies, e.g. for funding and contractual purposes.

4. ## Teamwork/people management

   Manages own research and administrative activities, with guidance if required.

   Collaborates with academic colleagues on research projects and areas of shared research interest. Providing guidance to support disabled and non-disabled staff and students who may be assisting with the research. Actively participating as a member of a research team.

5. ## Liaison and networking

   Builds internal contacts and participates in internal networks to exchange information and to form trusting relationships for future collaboration.

6. Teaching and learning

Assists in the development of student research skills. Contributes to the assessment of student knowledge and supervision of projects.

7. Other

Sensory and physical demands will vary from relatively light to a high level depending on the discipline and the type of work.

Depending on the area of work and level of training received, may be expected to conduct personal risk assessments.

Comply with the University's equal opportunities policy, and use this role to promote equal opportunity wherever possible.

Responsible for your own health and safety and that of your colleagues, in accordance with the University's health and safety policy.

Person specification

Qualifications/Professional membership

Essential

1. Will have completed (or be close to completion of) a PhD (or equivalent research experience) in a discipline relevant to the project, for example, this could be computer music, human-computer interaction (HCI), computer science, electronic engineering, mechatronics, robotics, design engineering, or music composition.

Knowledge/Skills/Experience

Essential

1. Knowledge of established literature and research methods relating to digital musical instrument design and human-computer interaction (HCI) and an ability to analyse, and interpret research data to generate outcomes
2. Committed to continually updating knowledge of the relevant domain and an ability to conduct detailed literature reviews
3. Experience with methods for identifying or classifying human interactions from sensor data in real-time (e.g. with AI/machine learning) and an awareness of one or more relevant programming languages or environments (e.g. python, C++, etc.)
4. A creative approach to problem-solving and an ability to develop and apply new concepts and methods. An ability to apply findings creatively to develop new areas of research
5. Highly effective communication skills and experience writing and publishing

in peer-reviewed journals and/or conferences

6. Strong verbal, interpersonal and presentation skills with an ability to present at conferences and communicate effectively with diverse people and audiences.
7. Ability to effectively manage and prioritise own workload, research resources, and administrative activities to meet milestones and deadlines
8. Ability to work as part of a team and engage in personal and professional development relevant to the role

Desirable

1. Knowledge of 3D design, prototyping and fabrication with a range of materials and techniques (e.g. 3D printing, laser cutting, moulding, etc.)
2. Musical experience as a performer, composer, sound artist or improviser
3. Lived experience of disability and/or knowledge of disability studies, arts, culture, and the social model of disability
4. Experience designing and facilitating accessible interactive workshops