Aston University
BIRMINGHAM UK

Postdoctoral Research Associate

Postdoctoral Research Associate: Distributed Fibre Optic Sensing & Digital Twin Infrastructure (SmartChar)

Reference: 0775-26

Grade: 08/09

Salary: £41,064 to £56,535 per annum, depending on experience

Contract Type: Fixed Term (up to 60 months at Grade 8, up to 54 months at Grade 9)

Basis: Full Time

Job description

Job Purpose:

We are seeking a highly motivated Postdoctoral Researcher to join the flagship SmartChar programme, a five-year, EPSRC funded research programme focused on developing self-sensing, low-carbon concrete infrastructure through the integration of biochar materials, advanced fibre optic sensing, and digital technologies.

This role focuses on the development of Distributed Fibre Optic Sensing (DFOS) systems embedded within concrete, enabling infrastructure to monitor its own condition in real time. The position combines sensor development, optical interrogation (e.g. OFDR), and data analytics, contributing to the creation of intelligent systems for structural health monitoring and digital twin applications.

The successful candidate will work closely with colleagues in photonics, civil engineering, and data science, as well as the whole programme team and its industrial partners.

Main Duties and Responsibilities:

Research and Technical Responsibilities:

- Carry out research activities across two work packages, ensuring delivery of key technical milestones.
- Design and develop fibre optic sensing systems (e.g. fibre gratings and DFOS) and integrate them within biochar-concrete structures, including suitable packaging for harsh environments.
- Develop and optimise optical interrogation systems (e.g. Optical Frequency Domain Reflectometry, OFDR) to enable high-resolution measurement of strain, temperature, and structural behaviour.
- Plan and conduct laboratory experiments and structural testing, working with civil engineering partners to validate sensing performance under realistic conditions.
- Analyse sensing data using signal processing and machine learning methods to detect, locate, and classify structural damage.
- Integrate sensing data into digital models and digital twin frameworks to support predictive monitoring, performance assessment, and lifecycle decision-making.

Collaboration and Project Support

- Work collaboratively with academic staff, researchers, and industrial partners across the SmartChar programme.
- Contribute to project meetings, reporting, and coordination activities.
- Support the supervision of PhD students and junior researchers where appropriate.

Dissemination and Impact

- Publish research findings in high-quality peer-reviewed journals.
- Present at national and international conferences.
- Contribute to industry engagement, knowledge transfer, and potential commercialisation activities.

As a part of the 5-years SmartChar programme, the postholder will primarily contribute to their assigned Work Packages, and will support cross-cutting activities such as standardisation, policy, engagement and training, as appropriate.

Additional responsibilities

- Engage in continuous personal and professional development in line with the demands of the role, including undertaking relevant training and development activities to develop themselves and support the development of others.
- Ensure and promote the personal health, safety and wellbeing of staff and students.
- Carry out duties in a way which promotes fairness in all matters and which engenders trust.
- Promote equality of opportunity and support diversity and inclusion as well as working to support the University's environmental sustainability agenda and practices.

Person specification

	Essential	Method of assessment
Education and qualifications	A PhD (or near completion) in photonics, fibre optics, data analytics, civil engineering, electronic engineering, or a closely related field.	Application form
Experience	Experience in fibre optic sensing, ideally including fibre grating–based systems, AND/OR Knowledge of optical interrogation techniques (e.g. OFDR or similar). Experience in experimental systems and data analysis (e.g. Python, MATLAB or similar). Ability to contribute to academic publications and research dissemination.	Application form and interview
Aptitude and skills	Strong analytical and problem-solving skills. Ability to work independently and as part of a multidisciplinary team. Good communication and organisational skills.	Application form and interview

	Desirable	Method of assessment
Experience	Experience with distributed fibre optic sensing (DFOS) or structural health monitoring.	Application form and interview

	Desirable	Method of assessment
	Familiarity with machine learning or advanced data analytics. Experience working with civil engineering materials or infrastructure systems. Experience collaborating with industry or applied research projects.	

University values

All staff are expected to demonstrate/promote the University's values and expectations, which are an integral part of our strategy and underpin the culture of the University. In addition, our leaders are expected to be accountable, help to execute strategic visions of the University and share and set clear expectations that inspire those around them.

How to apply

You can apply for this role online via our website https://www2.aston.ac.uk/staff-public/hr/jobs.

Applications should be submitted by 23.59pm on the advertised closing date.
All applicants must complete an application form, along with your CV.

Any CV sent direct to the Recruitment Team and Recruiting Manager will not be accepted.

If you require a manual application form, then please contact the Recruitment Team via recruitment@aston.ac.uk.

Contact information

Enquiries about the vacancy:

Name: Dr Kaiming Zhou
Job Title: Senior Research Fellow, Aston Institute of Photonic Technologies
Email: c.alexakis@aston.ac.uk

Name: Dr Haris Alexakis
Job Title: Lecturer in Civil Engineering (Aston Institute of Photonic Technologies)
Email: c.alexakis@aston.ac.uk

Name: Dr Abed Alaswad

Job Title: Reader in Mechanical Engineering and SmartChar Principle Investigator
Email: a.alaswad@aston.ac.uk

Enquiries about the application process, shortlisting or interviews:
Recruitment Team via recruitment@aston.ac.uk or 0121 204 4500.

Additional information

Visit our website https://www2.aston.ac.uk/staff-public/hr for full details of our salary scales and benefits Aston University staff enjoy.

Salary scales: https://www2.aston.ac.uk/staff-public/hr/payroll-and-pensions/salary-scales/index

Benefits: Benefits and Rewards | Aston University

Working in Birmingham: https://www2.aston.ac.uk/birmingham

Employment of Ex-Offenders: Under the Rehabilitation of Offenders Act 1974, a person with a criminal record is not required to disclose any spent convictions unless the positions they applying for is listed an exception under the act.

Eligibility to work in the UK: Where an individual is subject to UK immigration control, they will require a visa to work in the UK.

The following individuals do not need a visa for the UK, but do still have to prove their right to work before employment can commence:

- **British Citizens or Irish Nationals**
- **EU/EEA/Swiss nationals with Settled or Pre-settled status under the EU Settlement Scheme**
- **Non-EEA nationals with Indefinite Leave to Remain/Settlement in the UK**

The main routes available for those who need a visa to work in the UK are **Skilled Worker**, **Global Talent** and the **Graduate Route**.

Please see UKVI guidance for further information on eligibility, knowledge of English requirements and approved test centres https://www.gov.uk/skilled-worker-visa You can also find further information on our candidate immigration web page.

If you will conduct research in your role, you may need to apply for and obtain ATAS clearance before Aston can issue a Certificate of Sponsorship for your visa application. Please see our candidate immigration web page for further details.

Before you start and Right to Work

Right to Work Check
All employees must complete a Right to Work check before they commence work at Aston. HR will contact you during the onboarding process to arrange your check.

Cost of Living - Estate and Letting Agents
There are numerous Estate and Letting Agents that can help you find suitable accommodation. Useful websites for support and guidance https://www.gov.uk/government/publications/how-to-rent/how-to-rent-the-checklist-for-renting-in-england and https://www.citizensadvice.org.uk/housing/
You can also use property search websites such as Rightmove or Zoopla.

Equal Opportunities
Aston University promotes equality and diversity in all aspects of its work. We aim to ensure, through our admissions policies for students, and our staff recruitment and selection processes that we encourage applications from all groups represented in the wider community at a local, national and international level.

The University will endeavour not to discriminate unfairly or illegally, directly or indirectly, against student or potential students, staff or potential staff. This commitment applies to all functions of the University and to any stage of an individual's career.

An Equal Opportunities Monitoring Form is included within the application form. Data you provide on the Equal Opportunities Monitoring Form will be included in a general database, for statistical monitoring purposes, enabling the University to monitor the effectiveness of its Policy, Codes of Practice and Guidelines on Equal Opportunities in Employment. Individuals will not be identified by name.

Data Protection
Your personal data will be processed in compliance with the Data Protection Act 2018 and the General Data Protection Regulation ((EU) 2016/679) ("GDPR"). The University's Data Protection Policy and Privacy Notices, including the Job Applicant Privacy Notice can be found at https://www2.aston.ac.uk/data-protection. Your application will only be used to inform the selection process, unless you are successful, in which case it will form the basis of your personal record with the University which will be stored in manual and/or electronic files. Information in statistical form on present and former employees is given to appropriate outside bodies.
Full details of our terms and conditions of service and associated policies and procedures are available online at https://www2.aston.ac.uk/staff-public/hr/policies

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