

Research Associate / Senior Research Associate in Intelligent Optical Network Architecture, Automation and Resilience

1 JOB DESCRIPTION

Faculty / School or Division: Faculty of Engineering /School of Electrical, Electronic and Mechanical Engineering (EEME)

Faculty/School or Division Address: Merchant Venturers Building, Woodland Road, Bristol BS8 1UB

Place of Work: Sloane Robinson Building, University of Bristol, Cattle Market Road, Bristol, BS1 6AZ

Job Family:	Research and Teaching		
Grade/Pathway:	Grade I / J (subject to experience) Pathway 2	Salary range:	Grade I: £40,704 - £45,641 per annum Grade J: £45,641 - £51,258 per annum
Hours of work:	35 hours per week	Contract type:	open-ended with fixed funding until 31/03/2030 subject to funding – including the mid-term review scheduled for mid-2028
Work pattern:	Full time	Vacancy Reference Number: ACAD108743	

1.1 Main Job Purpose

The Smart Internet Lab is looking for highly motivated, enthusiastic researchers at different career stages to develop new optical network architectures and connectivity solutions for future digital infrastructure. The role will prioritise programmable, reconfigurable and resilient optical networks for cloud, edge and AI applications, alongside network automation, orchestration and rapid recovery from failures and performance degradation. Sensing, network telemetry and physical-layer monitoring will provide the awareness needed for closed-loop control and resilient network operation.

The successful candidate will contribute to the HASC Phase 2 programme and associated optical networking research at the University of Bristol. HASC is an EPSRC Hub for All-Spectrum Connectivity,

bringing together wired and wireless technologies to support end-to-end connectivity and collaboration across academic and industrial partners. The post holder will develop and evaluate architectures, control algorithms and hardware or software prototypes through laboratory and testbed experiments, using relevant experimental infrastructure, including JOINER, where appropriate.

The post holder will join the Smart Internet Lab, which is one of the UK's most renowned Information and Communications Technology (ICT) research centres. Our 200 experts address grand societal and industrial challenges associated with 5G/6G radio/wireless, optical communications, and networks. We are challenging the complexity of tomorrow's world by fusing research expertise and innovation in areas such as IoT, 5G/6G & Beyond, Future Transport Networks, Smart Cities, Autonomous Networks, Machine Learning, Artificial Intelligence, Network Convergence, Mobile Edge Computing, and Network Softwarisation. Our unique offering across optical, wireless, IoT, and cloud technologies enable us to bring together end-to-end network design and optimisation, impacting regional, national, and global ICT innovations.

You can find more information about the Smart Internet Lab via the links below:

<http://www.bristol.ac.uk/engineering/research/smart/>

1.2 Main Statement of Responsibilities

Research Responsibilities

You will undertake research on intelligent optical network architecture, automation and resilience, and develop and experimentally validate hardware or software prototypes in the following areas:

- Develop new optical network architectures and connectivity solutions for scalable, high-capacity and programmable metro, access and data centre networks.
- Develop network automation, orchestration and resource-control mechanisms, including software-defined networking, dynamic configuration and AI-assisted optimisation.
- Develop and evaluate network resilience and recovery mechanisms, including fault detection and localisation, rapid reconfiguration, restoration and graceful degradation.
- Integrate sensing, telemetry and physical-layer monitoring as enabling capabilities for network awareness, closed-loop control and recovery, and validate performance through laboratory or field trials.

You will carry out work, leading to publications in high-quality journals and presentation at international conferences. You will support collaboration with a wide range of industrial and academic partners.

You will contribute to the preparation and submission of research proposals, standards applications and patent applications, and contribute towards further evolving the existing experimental facilities and assist in project management duties.

Depending on grade, you may have duties on supervising and supporting early career colleagues and PhD students.

Administration Responsibilities

Support organisation of events relating to the project as well as research dissemination (e.g. industrial workshops, scientific knowledge, and skills exchange days, etc.)

Support reporting requirements for project partners and funders, ensuring timely and accurate submission of all necessary documents.

Ensure compliance with funder and team requirements, including the timely submission of expense claims and adherence to relevant protocols.

Contribute to the communications strategy of the project, including preparing content for social media, and helping to raise awareness of the project's activities and outcomes.

Teaching Responsibilities

As this role is a Pathway 2 (Research) role, there are no formally specified teaching duties required of the role-holder. However, other commitments permitting, the role-holder may be given development opportunities to undertake activities such as teaching on Masters and Doctoral programmes and/ or supervising MSc dissertations within the school, as appropriate.

1.3 Relationships

The post holder will work with Dr Shuangyi Yan, Professor Vladek Forysiak, and Professor Dimitra Simeonidou, and collaborate with other members of the Smart Internet Lab and HASC academic and industrial partners. Collaboration with colleagues in optical systems, network control and fibre sensing will support integrated network demonstrations.

Line manager: Dr Shuangyi Yan

1.4 Job Hazards/Safety Critical Duties (Pre-employment health screening)

Not applicable

2 PERSON SPECIFICATION

2.1 Relevant Experience, Skills and Knowledge

Essential

- Track record of relevant scientific publications or relevant research and development experience.
- Knowledge of optical network architectures and connectivity, with experience in network control, automation, orchestration or resilience.
- Practical experience of optical communication systems or network testbeds, and programming skills for prototyping, control or data analysis.

Essential (candidates for Grade J positions)

- Experience of independently developing and experimentally evaluating optical networking or network-control solutions, and taking significant initiative in research.
- Experience of integrating optical systems, network-control software or telemetry within experimental testbeds.
Experience of supporting early career researchers or students and coordinating collaborative research activities.

Desirable

- Proven track record in publishing in leading international journals and conferences
- Experience of software-defined networking, orchestration, resource allocation or automated network recovery.
- Experience in applying AI/ML to network optimisation, automation or fault diagnosis.
- Knowledge of fibre sensing, network telemetry or physical-layer monitoring for network awareness and control.
- Proposal writing & project-management experience, especially in multi-partner consortia

2.2 Relevant Qualifications***Essential (all candidates)***

A PhD or near completion, or equivalent research experience in an academic, industrial or clinical setting equivalent to a PhD. Research and development experience in optical communications, telecommunications, networking, electronic engineering, computer science or a closely related discipline, relevant to one or more of the following areas:

- Optical network architectures and connectivity.
- Network automation, orchestration, resilience and recovery.
- Sensing, telemetry or physical-layer awareness for intelligent network operation.

2.3 Communication and Interpersonal Skills***Essential (all candidates)***

- Ability and desire to learn quickly.
- Excellent verbal and written communication skills with a proven ability to work and communicate well across functional groups and with a wide range of people
- Demonstrable ability to write technical reports and scientific papers
- Excellent ability to work as part of a team and to be open-minded and cooperative

Desirable

Ability and experience of acting as a core liaison between the head of group and the commercial and other partners

2.4 Additional Criteria

Essential (all candidates)

- Ability to prioritise and work to deadlines while demonstrating a track record for innovation and creativity
- Ability to update and acquire new skills and knowledge in line with advances in the relevant subject area

Desirable

- Experience of day-to-day management and coordination of research in multi-partner research projects
Willingness to travel both within the United Kingdom and abroad to conduct research and attend conferences

3. CAREER PATHWAY AND OTHER RELEVANT INFORMATION

3 CAREER PATHWAYS

All members of academic staff have a clear career pathway involving a series of levels with distinct role profiles, each with its unique requirements. Each profile sets out what is expected of an academic at the particular level. The role profiles also set out a collection of competencies expected for each level. Progression or promotion to the next level will occur after these competencies have been attained and where a role at the higher level is available.

The academic pathways are as follows:

Career Pathway One - academic roles that combine teaching, research and administrative duties.

Career Pathway Two - academic roles focusing on research and associated administrative duties.

Career Pathway Three – academic roles focusing on teaching and associated administrative pathways.

This post is located on Pathway Two. Role Summaries setting out what is expected of an academic at each particular profile level on pathway two can be found below. Please note that an appointment may be made at any level of the pathway.

A schematic diagram of the career pathways can be found at <http://www.bristol.ac.uk/hr/grading/academic/>.

The University has two procedures for promotions depending on the level of promotion being applied for as follows:

Promotion up to Senior Lecturer / Senior Research Fellow
Promotion to Associate Professor or Professor

The procedure for Promotion up to Senior Lecturer / Senior Research Fellow describes the process for anyone on the academic career pathways and is based on the concept of readiness as determined with managers using the Academic Promotions Framework (APF). Eligibility for making a case for promotion is subject to:

1. Having a contractual expectation and meeting the performance requirements described in the Promotion up to Senior Lecturer / Senior Research Fellow process
2. Completion of a full year of service following appointment and successful completion of their Initial Service Review (ISR)
3. Meeting the expectations set out in the CREATE policy for those with teaching responsibilities (pathway 1 and 3), e.g. those seeking promotion to Senior Lecturer should achieve and have been formally notified of their Fellowship (ratified outcome) through the University's CREATE scheme before applying

The procedure for Promotion to Professor covers staff for promotion to profile level d2 (Associate Professor) and profile level e (Professor) on all pathways in the [Academic Career Pathway](#) framework.

3.1.1 Role Summaries

Research Associate (Level a)

Role holders at this level are concerned with *assisting* an individual research leader or team to conduct a particular study (or group of studies). They will generally be involved in data generation and/or collection using standard and well-defined methods developed by others. They will be working under close supervision by, and direction from, a more senior researcher, who will be ultimately responsible for the project. This may be the entry level for some staff who are expected to train and/or develop to take on more senior researcher roles. Role holders will be provided with academic and pastoral support within the department (including counselling on realistic career opportunities) and training will be available designed to develop their competences and to prepare them to take on more responsibilities associated with a higher grade.

Senior Research Associate (Level b)

Role holders at this level will be experienced and professional researchers (or have considerable professional experience) and will be specialists in a particular area or methodology, drawing upon knowledge gained from postgraduate research and/or working within a Level a role. They will be *associated* with a particular project (or projects) and will contribute ideas, and/or enhancement of techniques or methodologies. They will be expected to do some writing for dissemination outside the Department. They will still be working under supervision, but will be expected to take significant initiatives in their work and consult with the Principal Investigator over the details of the project. They may, where practical, contribute to the department's teaching, through supervision of projects, overseeing practical classes, or taking small group classes. They will be provided with academic and pastoral support within the department and training will be available designed to develop their competences (including counselling on realistic career opportunities) and prepare them to take on more responsibilities associated with a higher grade.

Research Fellow (Level c)

Role holders at this level will have substantial experience of research (normally not less than six years). They will initiate and take responsibility for some research projects and may be Principal Investigators or, where a Research Council does not permit this, act as though they were Principal Investigators. They will be involved in administration relevant to their projects (e.g. helping to prepare bids for research funding), managing other researchers and monitoring research budgets. They will be expected to be undertaking research individually and/or collectively and to be advancing the state of knowledge and understanding within their particular area of expertise. They will be publishing regularly in high quality outlets. They are likely to provide some teaching support for the department (consonant with the terms of their funding). They will be expected to be establishing a growing reputation within their particular research field and academic discipline and to be developing and demonstrating intellectual independence.

Senior Research Fellow (Level d)

Role holders at this level will have extensive experience in research and research management. They will normally be Principal Investigators, leading collaborative research bids and research teams, or driving forward innovative research themselves. They will be involved in scholastic projects (e.g.

editing journals and academic books), and be making a significant leadership and/or management contribution within their department or the wider university, to be participating in national/international academic networks and conferences. They may be transferring their knowledge through some teaching and/or supervision to undergraduate or graduate students (consonant with the terms of their funding). Role holders at this level will be independent researchers and will have an established national and growing international reputation within their academic discipline generally and research field in particular.

Professorial Research Fellow (Level e)

Role holders at this level will have very extensive experience of research leadership and related management/administration. They will enjoy a wide recognition for their expertise within the academic community internationally (as evidenced by conference invitations, journal editorships, office holding in specialist groupings, associations with appropriate Research Councils etc.). They will have made recognised and significant contributions to the developing knowledge and understanding of their research area. They will already have responsibilities for the creation, initiation, development and overall management of significant research programmes. They will “profess” their discipline within the Department, as appropriate and consonant with the terms of their funding. They may also carry significant leadership roles within the Faculty or University.

Informal enquiries should be addressed to Dr. Shuangyi Yan (Shuangyi.yan@bristol.ac.uk).