



Research Associate

Department	Electronic and Electrical Engineering (www.strath.ac.uk/engineering/electronicalelectricalengineering/)		
Faculty	Faculty of Engineering (www.strath.ac.uk/engineering/)		
Staff Category	Research	Reference No	629020
Reports To	Head of Department/Institute, through Dr Paul Murray	Grade	7
Salary Range	£36024 - £44263	Contract Type	Fixed Term (12 months)
FTE	1 (35 hours/week)	Closing Date	10/07/2024
Working Arrangements	Hybrid. The standard requirement across the University is that at least three days per week (based on IFTE) will be spent working on-site (with flexibility as appropriate).	On Site Facilities	Car parking, sports centre, catering.
Holidays	31 days + 11 statutory days Option to purchase additional holidays.		
Pensions	Contributory pension scheme available to all staff including generous employer contribution.		
Training	Professional Development with Organisational and Staff Development Unit (OSDU) plus external training if required.		
Family Friendly Benefits	Generous parental leave provision, on-campus nursery and options for flexible working.		
Health and Wellbeing	University Sport centre, Occupational Health service, access to health and wellbeing events, cycle to work scheme, Employee Assistance Programme, agile working and established carers support network and carer friendly policies.		

Job Advert

The Department of Electronic and Electrical Engineering (EEE) within the Faculty of Engineering is seeking to recruit a Research Associate to join and support a range of research projects investigating state-of-the-art signal & image processing and Artificial Intelligence (AI) for determination of the composition and behaviour of objects in space.

This is an exciting role aimed to develop AI models than can interpret the composition and behaviour of unknown objects in orbit using spectral, radar and other data sources. The projects form part of a wider venture to develop a range of AI tools for Space Safety and Sustainability, working with institutions such as: University of Arizona, MIT, University of Waterloo, ATI, Nominal Systems, GMV and LMO. This position is based at the University of Strathclyde, Glasgow City Centre campus. Main research objectives are:

O1. Generate time-series spectral data of objects orbiting earth by using a detailed simulator built by the University of Strathclyde. The simulator allows models of objects, such as satellites, to be built and have materials applied to each surface. The object can then be given an attitude and trajectory and the spectral data that would be visible from a telescope at a defined point on the earths surface can be simulated. Adaptations to the model are required to build additional satellites and object models, as well as define additional movement behaviours. Datasets are required to be generated using the simulator such that the output data can be aligned with other synthetically generated datasets and real data captured by partner organisations.

O2. Development of spectral and radar feature extraction techniques for use in neural networks. This can involve using/developing AI methods to extract salient features of information-rich datasets, feature space approaches such as embeddings (popular in GPT methods) or more knowledge-based approaches such as unmixing of spectra to known materials or satellite components.

O3. Development and training of neural networks for processing radar and spectra to determine object behaviour, such as attitude. This will build upon the concept of Physics Informed Neural Networks to train models where predictions are constrained by known physical principals leading to models that can be trained on smaller datasets and have greater robustness and explainability. Physics information and constraints are provided by project partners but an ability to build and train neural network architectures incorporating the provided constraints is required.

You will be joining a highly-regarded and dedicated research group of engineers and scientists at the Centre for Signal and Image Processing (CeSIP) and the HSI Centre, led by Dr Paul Murray, working in a people-oriented, well-equipped, laboratory-based research environment.

As a Research Associate, under the general guidance of a research leader, you will develop research objectives and proposals, play a lead role in relation to a specific project/s or part of a broader project, conduct individual and/or collaborative research, contribute to the development of new research methods, identify sources of funding, and contribute to the securing of funds for research, including drafting grant proposals and planning for future proposals. You will write up research work for publication, individually or in collaboration with colleagues, and disseminate the results via peer reviewed journal publications and presentation at conferences. You will join external networks to share information and ideas, inform the development of research objectives and to identify potential sources of funding. You will collaborate with colleagues to ensure that research advances inform departmental teaching effort and you will collaborate with colleagues on the development of knowledge exchange activities by, for example, participating in initiatives which establish research links with industry and influence public policy and the professions. You will supervise student projects, provide advice to students and contribute to teaching as required by, for example, running tutorials and supervising practical work. You will contribute in a developing capacity to Department/School, Faculty and/or University administrative and management functions and committees and engage in continuous professional development.

To be considered for the role, you will be educated to a minimum of PhD level in an appropriate discipline, or have significant relevant experience in addition to a relevant degree. You will have sufficient breadth or depth of knowledge in signal & image processing and machine learning / deep learning with excellent programming experience (MATLAB, Python, etc.) and a developing ability to conduct individual research work, to disseminate results and to prepare research proposals. You will have an ability to plan and organise your own workload effectively and an ability to work within a team environment. You will have excellent interpersonal and communication skills, with the ability to listen, engage and persuade, and to present complex information in an accessible way to a range of audiences.

The Research Associate may be required to travel for technical meetings, experiments (data acquisition) and demonstrations within the UK and internationally, therefore, applicants must be willing and able to travel. The position is based at Glasgow city centre.

Whilst not essential for the role, applications are welcomed from candidates with: relevant work experience, membership of relevant Chartered/professional bodies (including the Higher Education Academy), experience of relevant student supervision and teaching activities, and/or experience of knowledge exchange related activities.

Job Description

Brief Outline of Job:

To undertake a specific research project/s under the general guidance of a research leader; to establish a personal research portfolio and plan research proposals, with assistance from senior colleagues as required; to engage where required in relevant teaching, professional and knowledge exchange activities; and input to administrative activities.

Main Activities/Responsibilities:

1.	As part of a wider research group, lead the research activities in specific projects, including data generation, development of feature extraction methods and designing and training neural networks, delivering project objectives (O1-O3), disseminating outcomes via presentations, and writing up technical reports, with guidance from senior colleagues as required.
2.	Plan and manage own workload, with guidance from colleagues as required.
3.	Engage with project partners, periodically reporting project progress, main findings and any related issues.
4.	Identify sources of funding and contribute to the securing of funds for research, including drafting grant proposals and planning for future proposals.

5.	Write up research work for publication, individually or in collaboration with colleagues, and disseminate results as appropriate to the discipline by, for example, peer reviewed journal publications and presentation at conferences.
6.	Join external networks to share information and ideas, inform the development of research objectives and to identify potential sources of funding.
7.	Collaborate with colleagues to ensure that research advances inform departmental teaching effort.
8.	Collaborate with colleagues on the development of knowledge exchange activities by, for example, participating in initiatives which establish research links with industry and influence public policy and the professions.
9.	Supervise student projects, provide advice to students and contribute to teaching as required by, for example, running tutorials and supervising practical work.
10.	Contribute in a developing capacity to Department/School, Faculty and/or University administrative and management functions and committees.
11.	Engage in continuous professional development.

Person Specification

Educational and/or Professional Qualifications

(E=Essential, i.e. a candidate must meet all essential criteria to be considered for selection, D=Desirable)

E1 Good honours degree and PhD (or equivalent professional experience) in an appropriate discipline i.e., signal & image processing, computer vision, and machine learning / deep learning, hyperspectral imaging.

D1 Membership of relevant Chartered/professional bodies (including Higher Education Academy).

Experience

E2 Sufficient breadth or depth of knowledge in the relevant discipline/s to contribute to research programmes and to the development of research activities.

E3 Experience in machine learning / deep learning and general AI.

E4 Experience in spectral-spatial data processing and development of novel methods towards it.

D2 Experience in acquisition and analysis of HSI data.

D3 Experience using simulators for synthetic data generation.

D4 Experience in working with light-curve or other relevant data with applications in space.

D5 Experience in acquisition and analysis of general signal, image and video data.

D6 Experience of relevant student supervision and teaching activities.

D7 Experience of knowledge exchange related activities.

Job Related Skills and Achievements

E5 Developing ability to conduct individual research work, to disseminate results and to prepare research proposals.

E6 Ability to plan and organise own workload effectively.

E7 Ability to work within a team environment.

Personal Attributes

E8 Excellent interpersonal and communication skills, with the ability to listen, engage and persuade, and to present complex information in an accessible way to a range of audiences.

Other Relevant Factors

D8 Valid UK driving license.

Application Procedure

Applicants are required to complete an application form including the name of three referees who will be contacted without further permission, unless you indicate that you would prefer otherwise. Applicants should also submit a Curriculum Vitae and a covering letter detailing the knowledge, skills and experience you think make you the right candidate for the job. Applicants should also complete the Equal Opportunities Monitoring Form.

Other Information

Further information on the application process and working at Strathclyde can be found on our website (<http://www.strath.ac.uk/hr/workforus>).

Informal enquiries about the post can be directed to Dr Paul Murray, Reader, Electronic & Electrical Engineering (paul.murray@strath.ac.uk / 0141 5482527).

Conditions of Employment

Conditions of employment relating to the Research staff category can be found at: [Conditions of Employment](#).

Rewards and Benefits

Our staff have access to a wide range of outstanding benefits that include financial rewards, family friendly and wellbeing benefits and career development opportunities, details of which can be found [here](#).

Probation

Where applicable, the successful applicant will be required to serve a 9 month probationary period.

Pension

The successful applicant will be eligible to join the Universities' Superannuation Scheme. Further information regarding this scheme is available from [Payroll and Pensions](#).

Relocation

Where applicable, the University offers a relocation package to support new employees who meet the eligibility criteria. The relocation package is offered as a contribution towards costs incurred, and is designed to be flexible, allowing staff to use the financial support available in the way that will be most helpful to them. Further details are outlined in the Relocation Policy.

Equality and Diversity

The University of Strathclyde is a socially progressive institution that strives to ensure equality of opportunity and celebrates the diversity of its student and staff community. Strathclyde is people-oriented and collaborative, offering a supportive and flexible working culture with a deep commitment to our equality, diversity and inclusion charters, initiatives, groups and networks.

We strongly encourage applications from Black, Asian and minority ethnicity, women, LGBT+, and disabled candidates and candidates from lower socio-economic groups and care-experienced backgrounds.

University Values

The University's Values capture what we're all about: who we are, what we believe in and what we stand for. [Our Values](#) have been derived from how we act and how we expect to be treated as part of Strathclyde.

