



1 Advertisement

Post Title: Research Fellow in Bio-Inspired Artificial Intelligence and Robotics

School/department: School of Engineering and Informatics

Hours: Full time

Requests for flexible working options will be considered (subject to business need).

The position involves teamwork and frequent interactions with team members as well as field work in Sussex and two visits to Australia for 1-3 months each time. Both in Sussex and Australia, this will mean work with mobile robots and ants in fieldwork settings in Sussex/Australia. Additionally, visits to collaborators in Sheffield and some international travel to conferences or workshops may be required.

Contract: fixed term until 03 January 2024

Reference: 10131

Salary: starting at £35,333 to £42,155 per annum, pro rata if part time

Placed on: 27 October 2022

Closing date: 22 November 2022. Applications must be received by midnight of the closing date.

Expected Interview date: TBC

Expected start date: 03 January 2023

We are looking for a post-doctoral research fellow to join our team working on bio-inspired AI and robotics who will develop novel active AI algorithms that are inspired by the rapid and robust learning of insects. You will join the prestigious £1.2m EPSRC International Centre to Centre Collaboration project: "ActiveAI: active learning and selective attention for rapid, robust and efficient AI." and will work in collaboration with the University of Sheffield and world-leading neuroscientists in Australia.

Your primary role will be to develop a new class of ActiveAI controllers for problems in which insects excel but deep learning methods struggle. These problems have one or more of the following characteristics: (i) learning must occur rapidly, (ii) learning samples are few or costly, (iii) computational resources are limited, and (iv) the learning problem changes over time. Insects deal with such complex tasks robustly despite limited computational power because learning is an active process emerging from the interaction of evolved brains, bodies and behaviours. Through a virtuous cycle of modelling and experiments, you will develop insect-inspired models, in which behavioural strategies and specialised sensors actively structure sensory input while selective attention drives learning to the most salient information. The cycle of modelling and experiments will be achieved through field work in both Sussex and Australia.

You will work under the supervision of Professors Andrew Philippides, Thomas Nowotny and Paul Graham within the Department of Informatics at Sussex and will join an active team of research fellows and PhD students working on similar topics at Sussex.

Please contact Prof Andrew Philippides, andrewop@sussex.ac.uk for informal enquiries.

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.

“Please note that this position may be subject to [ATAS clearance](#) if you require visa sponsorship.”

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.

2. The School / Division

Please find further information regarding the Department at <https://www.sussex.ac.uk/informatics/>

3. Job Description

Job Description for the post of: Research Fellow in bio-inspired AI

Department: Informatics

Section/Unit/School: Engineering and Informatics

Location: Chichester I Building, Falmer Campus

Grade: 7

Responsible to: Prof Andrew Philippides (PI) through to Head of School

Key contacts: Members of research group, members of faculty within the School and University.

Role description: Research Fellow I is an early career-grade research position. Post-holders will be expected to contribute to the work of the research team, and also to develop their research skills with support from more experienced members of staff.

PRINCIPAL ACCOUNTABILITIES

1. 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.
2. To contribute to School teaching activities.

KEY RESPONSIBILITIES

1. Research, Scholarship & Enterprise

- 1.1 Develop research objectives and proposals for own or joint research, at acceptable levels, with assistance if required.
- 1.2 Conduct research projects individually and in collaboration with others.
- 1.3 Analyse and interpret research findings and draw conclusions on the outcomes.
- 1.4 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.
- 1.5 Contribute to the preparation of proposals and applications to external bodies, for example for funding purposes.
- 1.6 Individually or with colleagues, explore opportunities for enterprise activity, knowledge exchange income and/or consultancy, where permissible.
- 1.7 Build internal contacts and participate in internal networks and relevant external networks in order to form relationships and collaborations.
- 1.8 Continually update knowledge and understanding in field or specialism, and engage in continuous professional development.

2. Teaching & Student Support

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

3. Contribution to School & University

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

4. Role-specific duties

- 4.1 Formulate, implement and test computational models of insect visual learning (including visual navigation in ants, target tracking in hoverflies and selective attention).

- 4.2 Apply models of insect visual learning to robotic platforms and test them rigorously in field sites in Sussex and Australia
- 4.3 Distil insights from how insects learn rapidly and robustly and from small amounts of data to help develop new active AI algorithms
- 4.4 Contribute to insect behavioural experiments being undertaken in Sussex and Australia through research visits (1-3 months in duration) and establish a collaboration between the UK and Australian partners
- 4.5 Embed skills in neural and robotic modelling in the Australian partner research groups
- 4.6 Participate actively in project meetings with international collaborators both online and in-person as required
- 4.7 Present results at leading international conferences and publish in leading international journals
- 4.8 Contribute to the public dissemination of project progress and results in addition to high quality publications by contributing to the web presence, social media and appropriate other forms of public engagement.

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.

INDICATIVE PERFORMANCE CRITERIA

- A PhD or equivalent scholarly or relevant professional activity
- Pursuing a line of independent research within a research group.
- Publishing research (either from a recently completed PhD or new original research).
- Other forms of externally recognised professional practice of creative output of a standing equivalent to regular publication of original research.
- Initiating, developing or participating in links between the University and external bodies such as business and industry, the professions, community organisations and policy-makers.
- Evidence of successful engagement in teaching or supervision.

PERSON SPECIFICATION

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.

ESSENTIAL ROLE-SPECIFIC CRITERIA

1. Strong background in robot navigation, machine learning, computational Neuroscience, bio-inspired AI, or a relevant related area
2. Strong technical and analytical skills with expert level programming in a relevant programming language, e.g. Python, C++, ...
3. Familiarity with modern machine learning methods
4. Interest in biological intelligence and learning
5. Ability to spend extended visits (1-3 months duration) in Australia
6. Ability to collaborate openly and to work in multi-disciplinary research teams.
7. Experience of preparing and publishing scientific articles in high impact journals
8. Experience of autonomous robotics
9. Experience of neural simulations or biological modelling

DESIRABLE CRITERIA

1. Emerging track record of high-quality publications in reputable journals and other appropriate media of similar standing.

2. Experience of generating research or knowledge exchange income.
3. Experience of computer vision/image processing
4. Experience with the GeNN framework or GPGPU computing/parallel computing
5. Knowledge of neuroscience, in particular relating to insect visual learning or selective attention
6. Experience of animal behavioural experiments
7. Good software engineering skills.
8. Experience of embedded systems