



1 Advertisement

Post Title: Research Fellow in Complex Systems

School/department: School of Engineering and Informatics – Department of Informatics

Hours: full time or part time hours considered up to a maximum of 1 FTE.

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

Contract: fixed term until 31 July 2024

Reference: 9304

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

Placed on: 26 July 2022

Closing date: 11 August 2022. Applications must be received by midnight of the closing date.

Expected interview date: Expected first week of September

Expected start date: 01 October 2022

We are looking for a post-doctoral research fellow with a strong mathematical and/or computer science background to work with Prof Luc Berthouze and Dr George Parisi on the highly-interdisciplinary project “Rethinking large-scale network management through the lens of neuroscience”.

The project aims to transform the way ICT networks are being conceptualised for management, by developing a data-driven characterisation of emerging dependencies between ICT components inspired by recent neuroscientific paradigms used to study the brain and allowing to capture and act upon the functional impact of complex and changing interactions across layers and processes.

In the first phase of the project, the PDRA will develop and implement methods for inferring time-varying latent inter-dependencies based on events emitted, processed and stored in modern network and service deployments. Conceptual challenges to be met include the presence of multiple time scales as well as hierarchical organisation.

In the second phase of the project, the aim is to disambiguate hypothetical causal structures from the above statistical dependencies, with the view to provide interpretable and actionable insights. Use-case scenarios considered will be failure prediction and root-cause-analysis.

We are looking for a researcher with a proven record of developing and deploying machine learning / mathematical and statistical modelling for network inference in large-scale complex systems (e.g., biological, social or technological networks). Strong technical skills are required. Befitting the interdisciplinary and high-impact nature of the project, the candidate should be willing to engage with both academic and industrial partners.

Please contact Prof Luc Berthouze, l.berthouze@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 Complex Systems

Department: Informatics

Section/Unit/School: Engineering and Informatics

Location: Chichester I Building, Falmer Campus

Grade: 7

Responsible to: Prof Luc Berthouze (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 Develop and implement machine learning / mathematical and statistical (including causal inference) modelling methods adapted to the kind of data emitted, processed

and stored in large-scale network deployments (from discrete events to continuous variables).

- 4.2 Evaluate the performance of the methods (including across applicable disciplines).
- 4.3 Participate actively in project meetings with collaborators and partners both online and in-person as required.
- 4.4 Publish scientific results in high quality journals and present work at leading international conferences.
- 4.5 Exchange expertise with PhD students and colleagues.

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 in mathematics or physics (preferably), computer science, or equivalent
- 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. Demonstrable ability to develop and deploy machine learning / mathematical modelling / statistical (including causal) inference in large-scale complex systems. These do not have to be computer network related.
2. Strong programming skills in a relevant programming language, e.g. Python, C++, ...
3. Experience of writing high-quality technical reports and publications.
4. Ability and willingness to interact with other team members, including industrial stakeholders

DESIRABLE CRITERIA

1. Experience of generating research or knowledge exchange income.
2. Familiarity and/or experience with one of:
 - a. Network inference methodologies used in neuroscience (e.g., functional and effective connectivity).
 - b. Computer network analysis and management