Sainsbury Wellcome Centre

Research Software Engineer – Behaviour and Neural Data
Information for Candidates

Sainsbury Wellcome Centre
&
Gatsby Computational Neuroscience Unit

Sainsbury Wellcome Centre for Neural Circuits and Behaviour at UCL

GATSBY

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Vacancy Reference:	1877801
Job Title:	Research Software Engineer – Behaviour and Neural Data
Department:	Sainsbury Wellcome Centre & Gatsby Computational Neuroscience Unit
Salary:	Competitive plus benefits
Grade:	8
Hours:	36.5 per week (full-time, 1.00 FTE)
Reports to:	Director, Sainsbury Wellcome Centre
Available until:	Funded until 31 October 2025 in the first instance.

About the Sainsbury Wellcome Centre

The Sainsbury Wellcome Centre (SWC) brings together world-leading scientists to investigate how brain circuits process information to generate perception, form memories and guide behaviour. Developed through the vision and partnership of the Gatsby Charitable Foundation and Wellcome, and with substantial investment from these partners, the mission of the SWC is to generate experimentally testable theories of brain function.

SWC comprises 12 highly interdisciplinary experimental research groups accommodated in a new, purpose-designed building, offering an outstanding and unparalleled research environment. SWC scientists use a broad spectrum of the latest advances in molecular and cellular biology, imaging, and advanced neural and behavioural recording techniques, in order to explain how animal behaviour arises from activity in neural networks. Scientists at SWC enjoy state-of-the-art research laboratories, cutting-edge scientific equipment, technologically-advanced prototyping and fabrication laboratories and custom in-house high-performance computing facilities. The full complement of scientists in the Centre is expected to reach around 150 together with circa 50 dedicated support staff.

About the Gatsby Computational Neuroscience Unit

The Gatsby Computational Neuroscience Unit (GCNU) was created at UCL in July 1998 with funding from the Gatsby Charitable Foundation. The Unit has become a world-class centre for theoretical neuroscience and machine learning. Its core strengths are in computationally and probabilistically oriented theoretical neuroscience and in probabilistic and statistical machine learning. In neuroscience, we have contributed to the understanding of neural coding, dynamics and computation, to reinforcement and unsupervised learning, and to normative models of behaviour. As a high profile, international research centre, the Unit has in place extensive visitor, seminar and workshop programmes.

The Unit's co-location with SWC creates the potential for a uniquely close interaction between theory and experiment in neuroscience, and for the integrated study of perception, control and learning in natural and artificial systems. These interactions are supported by connected PhD programmes, a joint postdoctoral fellowship, shared staff, and frequent formal and informal interactions amongst investigators.

SWC and GCNU are most closely linked with the UCL Faculties of Brain Science and Life Sciences and are aligned with Life Sciences (FLS). The FLS leadership team works closely with SWC and GCNU leadership to support and enable their mission and facilitate research excellence.

Further details about UCL can be found at www.ucl.ac.uk.

The Role of the Research Software Engineer

SWC and GCNU seek to extend their mission by establishing a new Data Centre, with a technical team whose role will be to translate and adapt novel machine learning tools as well as neural and behavioural data analysis technologies into robust, scalable, open and useable software applications and platforms suitable for use by collaborators and by a wider audience. The Research Software Engineer will play a key role in this new team.

As a hands-on and creative Research Software Engineer you will help to design and implement new approaches for storing and querying multi-scale spatio-temporal data. Working alongside a small, fast-moving team, you will help us define and design critical system components, including data preparation, real-time processing pipelines, and exploratory data analysis.

The main focus of the role will be on establishing data architectures and data processing pipelines for efficient querying of complex, large-scale and multi-format datasets of neural and behavioural data (e.g. videography, electrophysiology and sensor data). You will work with academic and research staff, end-users and industrial partners to design, adapt, implement, document and publish these software systems. You will also work closely with our IT team to create data management workflows for internal users and for sharing of data with international research community. More generally, you will have the opportunity to work closely with neuroscientists, electrical and mechanical engineers to design large-scale data collection, analysis and interactive visualization systems for next generation brain data.

The technology platforms generated by the Data Centre will be of interest to a wide group of academic and industrial partners. The team will take new mathematical results, machine learning advances or prototype code and, together with academic staff, design and produce implementations that scale robustly to large data sets, and that are well documented and easily used. Published code will be open source, take advantage of modern hardware including parallel and GPU-enabled systems, and where possible be integrated into established machine learning software frameworks such as tensorflow and pytorch. Generalisable neural or behavioural data algorithms and data processing pipelines will be treated similarly, with open-source code contributed to large-scale neuroscience repositories including those maintained by the BRAIN project, the International Brain Laboratory, and similar international groups.

You will also have opportunities to become involved in the research programmes at the two Centres, assisting with and contributing to ongoing research projects.

This post is funded for five years in the first instance.

Main Duties and Responsibilities

Software design and implementation

- Work with scientists, engineers and IT experts from SWC and GCNU to design and implement robust software platforms, in order to build new architectures for data storage, querying and analysis.
- Design and develop software for implementation of novel machine-learning and data analytic algorithms, and to make them accessible for collaborators and end-users.
- Provide documentation of the design, specification and implementation of the software, suitable for developers seeking to maintain or extend it.
- Provide documentation of the use of the system, suitable for end users.
- Advise on the computational hardware necessary for the efficient operation of the software.
- Work with collaborators and end users to adapt data formats, interfaces and algorithms to address their needs.

Leadership

- Develop, train and supervise a small team of research engineers to assist with the implementation of the software design and documentation.
- Provide technical leadership within the team.
- To undertake all appropriate line management responsibilities for staff including annual appraisals, absence management and other activities as required.

Communication/teamwork

- Work closely with SWC and GCNU principal investigators, researchers, research students and engineers sharing knowledge and advice.
- Liaise with experimentalist collaborators on data storage formats and curation, to help streamline analysis pipelines.
- Liaise closely with existing IT support staff in the Centre.
- Provide support and cover to colleagues in the team, sharing knowledge and expertise to help solve problems.

Research

- Engage with research scientists at SWC and GCNU to help design experiments and analyse neural and behavioural data.
- Engage with ongoing machine learning and neural data analysis research at SWC and GCNU.
- Work with collaborators within and outside the Centre to adapt existing algorithms to new contexts.

Other

- Commitment to continued professional development by attending and participating in relevant training programmes.
- Attend research seminars pertinent to the post as designated by the Director and principal investigators.

You will be expected to actively follow all UCL policies and procedures including Equal Opportunities, maintain an awareness of Fire and Health & Safety Regulations, carry out duties in a resource efficient way as well as actively support UCL's Sustainability policies and objectives, attend management meetings and undertake such training and development as may be required for the post.

You must ensure organisational compliance, and conformance with the Data Protection Principles. All data, whether stored electronically or by other means must be processed in accordance with the General Data Protection Regulations 2018.

All staff are required to act professionally, co-operatively and flexibly in line with the requirements of the post.

The above description is not exhaustive, and you will be required to undertake any other duties as may reasonably be requested within the scope, spirit and purpose of the post. Job descriptions are reviewed on a regular basis including at the annual appraisal. As duties and responsibilities change, the job description may be amended in consultation with you.

Selection Criteria

The selection criteria outline the skills, knowledge and experience required in order to perform this role. Applicants will be selected based on how well they demonstrate that they meet the essential, and if appropriate, desirable criteria for this particular role.

	Essential	Desirable
Qualifications		
A PhD degree or equivalent experience following a post-graduate degree in machine learning, statistics, computing, or a related field.		Desirable
An undergraduate degree with extensive subsequent experience in machine learning, statistics, computing, or a related field.	Essential	
Knowledge and experience		
Advanced experience with systems programming languages such as Java, C/C++/C#, and operating system command languages (e.g. Bash, Powershell).	Essential	
Experience designing and deploying database management systems (e.g. in SQL or one of its derivative languages) and APIs for interfacing them with other programming languages.		Desirable
Substantial experience with at least one of Python/NumPy or MATLAB; and good familiarity with the other.	Essential	
Experience with low-level CUDA programming.		Desirable
Substantial experience and knowledge of software development best practice including testing, documentation, version control etc.	Essential	
Experience working with large time-series data and/or location-based data.		Desirable
Experience in signal processing.		Desirable
Education or experience in systems neuroscience and working with neural data.		Desirable
Skills and abilities		
Strong written and oral communication skills, with the ability to present complex information clearly and effectively.	Essential	
Proven ability to manage multiple concurrent tasks and activities, working to deadlines and prioritising as appropriate.	Essential	
Ability to build strong collaborative working relationships with colleagues to deliver successful research outcomes.	Essential	
UCL Ways of Working for Professional Services		
Responding proactively and appropriately to the needs of colleagues, staff, students and partners.	Essential	
Accountability for decisions and actions.	Essential	
Sharing relevant knowledge and experience.	Essential	

Contact Us

Informal enquiries about the post are welcome to Professor Tom Mrsic-Flogel, Director of the SWC - t.mrsic-flogel@ucl.ac.uk

If you have any queries relating to the application process please email the SWC HR team: swc.hr@ucl.ac.uk.

Applying for the Role

Redeployment candidates

To begin the online application process, please access the advertisement by searching for it via the UCL Redeployment Service (https://www.ucl.ac.uk/human-resources/working-ucl/internal-opportunities) using the vacancy reference number.

Please complete the online application form, and use the supporting statement section to outline how you meet the selection criteria. Applications will be shortlisted based on the strength of the examples used to demonstrate that the applicant meets the selection criteria.

External candidates

To begin the online application process, please access the advertisement by searching for it on the UCL vacancy search page (http://www.ucl.ac.uk/hr/jobs/) using the vacancy reference number, and click on the “Apply Now” button at the bottom of the vacancy advertisement.

Please complete the online application form, and use the supporting statement section to outline how you meet the selection criteria. Applications will be shortlisted based on the strength of the examples used to demonstrate that the applicant meets the selection criteria.

Please note that there is a limit of 2,500 words to explain how you meet the essential criteria, and a limit of 2,500 words to explain how you meet the desirable criteria.

In addition to completing the online application form please also upload the following supporting documents to your application:

- A current CV
- Details of three referees including email addresses.

Please note that in the event that you are shortlisted, your referees will be contacted prior to interview. Please ensure that they are aware of this, and will be able to provide a reference in these circumstances.

All candidates will be notified of the outcome of their application.

Pre-employment Checks

Confirmation of appointment will be subject to receipt of satisfactory references, verification of proof of right to work in the UK and to satisfactory pre-employment health and security screening. The Centre will provide overseas candidates who may require sponsorship with support in seeking an appropriate visa.

Salary

Starting salary will be on the Grade 8 scale according to relevant skills, knowledge, experience and achievement. Staff incrementally progress along the salary scale; the effective date of incremental progression is 01 August each year. You must have completed the period of service stipulated in your contract of employment (typically your probationary period) to be eligible to increment. Incremental progression does not include the discretionary contribution points on the salary scale. Cost of living pay awards are negotiated nationally and are normally effective from 1 August each year.

Pension

Post-holders will be eligible to join the Universities Superannuation Scheme (USS), subject to the Scheme's rules and eligibility conditions.

Conditions of Service

Conditions of Service for Research, Teaching and Professional Services Staff can be found at: https://www.ucl.ac.uk/human-resources/conditions-service-research-teaching-and-professional-services-staff.

Probation

Appointments are subject to a probationary period of 9 months.

Hours of Work and Overtime

UCL's full time working week is 36.5 hours per week. SWC is willing to consider flexible-working arrangements, subject to discussion and agreement with your line manager.

Pre-agreed overtime will be offered as equivalent time off in lieu.

Annual Leave

Staff are entitled to 27 days annual leave per year (pro rata for part-time staff). In addition, staff are entitled to 8 days public and statutory holidays, and around 6 UCL closure days with pay per year.

Location

SWC and GCNU are located in the heart of London around five minutes' walk from the main UCL campus. The mainline railway stations at Euston, King's Cross, St Pancras, Marylebone and Paddington are within easy reach as are the London Underground stations located at Warren Street and Goodge Street.

Equal Opportunities

SWC and GCNU are committed to the promotion of equality, diversity and inclusion for its staff, students and visitors and is fully supportive of UCL's policy; the full equality policy statement is available online: https://www.ucl.ac.uk/human-resources/sites/human-resources/files/equal_opportunity_policy_statement.pdf.

SWC is currently working towards an Athena SWAN award.