Job Description

Senior Research Software Engineer

Department: Sainsbury Wellcome Centre
Grade: 8
Salary: £54,931 - £62,903 inclusive of London Allowance
Hours: 36.5
Reports to: Head of Advanced Microscopy Facility - Dr Rob Campbell
Available until: Initially funded until September 2028 with the possibility of extension subject to grant funding.

Context

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. The Centre comprises 13 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, electrophysiology and behavioural techniques and 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.

We are inviting applications for a research software engineer to be based in the Advanced Microscopy Facility working with the laboratories of Tom Mrsic-Flogel, Marcus Stephenson-Jones, Sonja Hofer and Tim Behrens in collaboration with the Neuroinformatics Unit.

Main purpose of the job

In-vivo functional calcium imaging is used extensively to study neural activity in behaving animals. The imaged neurons fall into a variety of cell types with different connectivity patterns and different roles in neural circuitry. However, although of cellular resolution, functional imaging data carry little information about cell type and therefore lack significant contextual information. We can anatomically extract the imaged region post-hoc and conduct ex-vivo labelling using fluorescent markers that bind to RNA and convey information about cell type. However, we lack a robust and easy to use software toolset for merging the in-vivo functional data with the ex-vivo transcriptomics cell-type data.

The Senior Research Software Engineer will build novel, high impact, domain tools that will simplify and accelerate data analysis within the Centre and beyond.

You will help us build robust software to merge and annotate in-vivo and ex-vivo imaging data of the same brain region. The aim is to correlate cellular resolution functional data with subsequent transcriptomic labelling of those same cells to link cell function to cell type.

You will be responsible for developing the missing software toolkit in collaboration with software engineers within and beyond the Centre.

You will develop optimised algorithms for interactive image registration, annotation, and data curation. These algorithms will be brought together into a unified graphical interface, allowing users to perform interactive registration and quality controls checks.

You will work with engineers in the SWC Neuroinformatics Unit and the [Francis Crick Institute](). You will collaborate with scientists and have opportunities to become involved in the research programmes at SWC. A budget will be provided for travel and training relevant to the post and your career aspirations.

Duties and responsibilities

Research (20%)

- Implement, develop and optimise algorithms for data processing.

Software design and implementation (40%)

- Work as part of a collaborative development team to design new software architecture.
- Develop software according to agreed specifications, including writing tests and high-quality documentation.
- Maintain new and existing software, fixing bugs and improving performance.
- Contribute to other related open-source projects.
- Keep up to date with developments in relevant methods, tools and frameworks by the neuroscientific and open-source software communities.

Training, support and dissemination (20%)

- Assist experimental collaborators applying software tools to their data.
- Respond to issues raised on GitHub repositories.
- Support users of software by answering questions on relevant community forums.
- Produce high quality training materials (e.g. tutorials) for potential users of the software.
- Design and deliver training courses (in person or online) for potential users of the software.

Communication/Teamwork (15%)

- Communicate with users, and potential users of software tools to establish current and future needs.
- Identify potential new collaborations that could benefit from software tools.
- Participate in one to one and group meetings, hackathons and group and institute events.

Other (5%)

- Update skills and education as required by attending and participating in continuing professional development education programmes.
- Attend research seminars pertinent to the post as designated by the Head Research Engineer and SWC faculty.

General

- Actively follow and promote all UCL policies including those on Equality, Diversity and Inclusion.
- Maintain an awareness and observation of Fire and Health & Safety Regulations.
- There may, on occasion, be a requirement to work extended hours.
- Follow and actively promote the [UCL Ways of Working]().
- This job description may be reviewed and be subject to amendment in consultation with the post holder.
- Act professionally, co-operatively and flexibly in line with the post.
- Comply with UCL's Sustainability policies and objectives.

Person Specification

Applicants should copy and paste the following essential criteria (which are assessed on the application form) into the "Statement in support of your application" and describe underneath each criterion how they meet it, giving examples.

Essential Criteria	Assessment method (Application/ Interview)
Qualifications, experience and knowledge	
Undergraduate degree in neuroscience, computer science, physics, mathematics, biology or a related field.	A
Substantial experience developing software for data acquisition, analysis or visualisation (evidenced by successful project completion).	A/I
Substantial experience and knowledge of software development best practice including testing, documentation and version control.	A/I
Significant experience in Python and, ideally, at least one other programming language used in research (e.g. Julia, C++, MATLAB, R, Java)	A/I
Significant experience working with transcriptomics, spatial, or imaging data.	A/I
Skills and abilities	
A commitment to developing robust, maintainable, documented software in an academic environment.	A/I
Ability to proactively identify areas for improvement and initiate new projects.	A/I
Ability to rapidly acquire a working knowledge of new programming languages, frameworks and libraries.	A/I
Ability to work with a team of scientists and research engineers to achieve defined outcomes.	A/I
Strong written and oral communication skills, with the ability to present complex information clearly and effectively.	A/I
Proven ability to manage multiple concurrent tasks and activities, working to deadlines and prioritising as appropriate.	A/I
Works ethically, legally and with integrity.	A/I

An understanding and appreciation of the mission and research environment of the SWC, and a commitment to the establishment of the SWC as a world-leading research centre.	A/I
Commitment to and knowledge of advancing equality, diversity and inclusion.	A/I
UCL Ways of Working	
Personal Excellence: Delivering on tasks and commitments to people.	A
Working Together: Sharing relevant knowledge and experience	A
Achieving our Mission: Making sense of complex issues even when information is incomplete.	A
Desirable Criteria (to be scored if there is a tie break for shortlisting)	
Postgraduate degree in neuroscience, computational biology, physics, computer science, machine learning or a related field.	A
Education or experience in systems neuroscience and working with neural data.	A
Experience with image registration.	A
Familiarity with multiphoton functional calcium imaging.	A

Apply

To apply for this position, please visit:
www.ucl.ac.uk/work-at-ucl/search-ucl-jobs and
search for vacancy reference:

Please complete the online application form and
use the supporting statement section to outline
your interest in joining SWC and how you meet
the essential and desirable criteria for the role.

If you have any queries regarding the
application process, please email:
swc.hr@ucl.ac.uk

For informal enquiries about the role, please
contact Head of Advanced Microscopy Facility,
Rob Campbell: rob.campbell@ucl.ac.uk

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

Annual Leave
Annual leave is 27 working days for a full-time
member of staff + 6 UCL closure days in
addition to 8 Bank Holidays.

Hours of Work
UCL's full time working week is 36.5 hours per
week. This role is eligible for hybrid working with
a minimum of 40% of time on site.

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.

Probation
Appointments are subject a 9-month
probationary period.

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

Other Benefits
UCL is a dynamic, global university based in
one of the most exciting capital cities in the
world, offering competitive terms, conditions
and benefits to its staff.

In addition to 41 days annual leave (inclusive
of public holidays and closure days) and
generous pension schemes, UCL provides a
number of other staff benefits. UCL benefits
and policies apply equally, whatever the
sexual orientation and/or gender identity of
employees. Benefits and policies relating to
employees' partners, includes both different
sex and same sex partners.

As part of the UCL community you can access
free lunch hour lectures, exhibitions,
museums and collections.