Information for Candidates

Head Research Engineer – Head of Gatsby/SWC Data Centre

Gatsby Computational Neuroscience Unit
&
Sainsbury Wellcome Centre

Sainsbury Wellcome Centre for Neural Circuits and Behaviour at UCL
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Vacancy Reference: 1881156

Job Title: Head Research Engineer – Head of Gatsby/SWC Data Centre

Departments: Gatsby Computational Neuroscience Unit
Sainsbury Wellcome Centre for Neural Circuits and Behaviour

Salary: Competitive plus benefits

Grade: 9

Hours: 36.5 per week (full-time, 1.00 FTE)

Reports to: Director, Gatsby Unit

Responsible for: 5-6 Direct Reports (Research Engineers)

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, make decisions 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 Unit (GCNU) was created at UCL in July 1998 under the directorship of Geoffrey Hinton with funding from the Gatsby Charitable Foundation. It is a world-leading centre for theoretical neuroscience and machine learning research and training; its former students and staff now run many academic and commercial institutes themselves.

Members of the Unit have made many key contributions to machine learning, statistics and neural data analysis, including foundational work on: learning in deep belief networks; recognition models; variational inference and variational Bayes; sparse Gaussian process methods; non-parametric Bayes; linear and non-linear independent components analysis; kernel-based non-parametric hypothesis testing and belief propagation; score matching; reinforcement learning; spike-sorting; Bayesian stimulus-response function models; Gaussian-process factor analysis and neural dynamical models.

Context

The Gatsby Unit and SWC share a new building opened in 2015, affording extensive opportunities for collaboration. The SWC building offers staff an
award-winning work environment in the heart of Bloomsbury with an on-site brasserie, access to lockers and changing facilities, secure bicycle storage, and access to pleasant outdoor spaces. The position also offers the full range of UCL staff benefits, including a generous annual leave entitlement, occupational pension schemes, excellent family-friendly policies such as occupational shared parental pay, a work-life balance policy, and a range of financial benefits such as a season ticket loan scheme and staff discounts.

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.

The Gatsby Unit and SWC 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 Gatsby Unit 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 Head Research Engineer - Head of Gatsby/SWC Data Centre

The Gatsby Unit and SWC together seek to establish a new Data Centre, a key technical team to support the development and maintenance of software systems necessary to advance research in the two groups and to make new algorithms and tools available to the global community. Reporting to the Director of the Unit, the Head Research Engineer will establish, develop and lead this new team; and work with the team, with academic staff in both the Gatsby Unit and SWC and with end-users to design, adapt, implement, document and publish these software systems.

The Data Centre team will translate and adapt novel machine learning, neural data analysis technologies developed in the course of Gatsby Unit and SWC research, along with key technologies developed elsewhere, into robust, scalable, open and useable software applications and platforms suitable for use by collaborators and by the global community. The team will also develop software and support technologies needed for research within the two research centres, including imaging, electrophysiology and behavioural control, data processing and archival, as well as analysis tools.

The role requires interactions and team work with multiple stakeholders in a vibrant research environment. You will work with academic and research staff, end-users and industrial partners to design, adapt, implement, document and publish software packages. 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 machine learning specialists to facilitate wide-ranging adoption of cutting-edge algorithms, and with neuroscientists and engineers to design large-scale data collection, analysis and interactive visualization systems for next generation brain data.

The majority of the software developed will be released to the community in open source formats. This may include integration with widely used environments such as tensorflow, pytorch or Bonsai, as well as contributions to specific repositories and libraries such as Shogun, and those maintained by the BRAIN project, the International Brain Laboratory, and similar international groups.

The team will also work with collaborators and end users to understand particular data sets or applications, and will have the opportunity to engage and assist with the research and development needed to adapt algorithms to address these use cases. In particular, a key role of the post-holder and team will be to facilitate practical interaction between the theoretical and algorithmic work of the Gatsby Unit and the experimental systems neuroscience carried out in the SWC.
Core Duties

Software design and implementation

• To work with academic members of the Unit to design and manage implementation of robust software and software platforms, in order to make available the novel machine-learning and data analytic algorithms developed within the Unit to collaborators and end-users.

• To work with scientists, engineers and IT experts from SWC and Gatsby Unit to design and implement robust data workflows, including new architectures for data storage, querying and analysis.

• To ensure delivery of documentation detailing the design, specification and implementation of the software, suitable for developers seeking to maintain or extend it.

• To provide documentation of the use of the system, suitable for end users.

• To advise on the computational hardware necessary for the efficient operation of the software.

• To work with collaborators and end users to adapt data formats, interfaces and algorithms to address their needs.

Leadership

• To develop, train and supervise a small team of research engineers to assist with the implementation of the software design and documentation.

• To 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

• To work closely with SWC and Gatsby principal investigators, researchers, research students sharing knowledge and advice.

• To liaise with experimentalist collaborators on data storage formats and curation, to help streamline analysis pipelines.

• To liaise closely with existing IT support staff in the Centre.

• To provide support and cover to colleagues in the team, sharing knowledge and expertise to help solve problems.

Research

• To engage with ongoing machine learning, neural analysis and experimental research in the Gatsby Unit and SWC.

• To work with collaborators within and outside the Units to adapt existing algorithms to new contexts.

Other

• To continue to update skills and education by attending and participating in continuing professional education programmes.

• To attend research seminars pertinent to the post as designated by the Director and principal investigators.

The above description is not exhaustive and the post-holder 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 the post-holder.

The post-holder 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.

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

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<th>Qualifications</th>
<th>Essential</th>
<th>Desirable</th>
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<td>A PhD, equivalent degree or equivalent experience following a post-graduate degree in computer science, machine learning, analytic neuroscience, or a related field.</td>
<td>Essential</td>
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<td>Education or experience in systems neuroscience and working with neural data</td>
<td>Desirable</td>
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<th>Knowledge and experience</th>
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<td>Experience managing technical or research staff</td>
<td>Desirable</td>
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<td>Substantial experience with at least one of Python/NumPy or MATLAB; and good familiarity with the other.</td>
<td>Essential</td>
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<td>Good familiarity with at least one of tensorflow and pytorch</td>
<td>Essential</td>
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<td>Experience with low-level CUDA programming.</td>
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<td>Experience creating new implementations of machine learning algorithms</td>
<td>Desirable</td>
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<td>Substantial experience and knowledge of software development best practice including testing, documentation, version control etc.</td>
<td>Essential</td>
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<td>Familiarity with probabilistic machine learning methods</td>
<td>Desirable</td>
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<tr>
<td>Experience creating new implementations of machine learning algorithms</td>
<td>Desirable</td>
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<td>A good working knowledge of linear algebra, probabilistic modelling and inference, along with strong analytical and mathematical skills.</td>
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<td>Successful line management experience</td>
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<th>Skills and abilities</th>
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<td>Strong written and oral communication skills, with the ability to present complex information clearly and effectively.</td>
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<td>A commitment to maintainable, documented, open-source software In an academic environment.</td>
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<td>Ability to lead a team of Research Engineers to achieve defined outcomes</td>
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<td>Ability to facilitate and support the professional development of Research Engineering staff</td>
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<td>Proven ability to manage multiple concurrent tasks and activities, working to deadlines and prioritising as appropriate.</td>
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<td>Able to build strong collaborative working relationships with colleagues to deliver successful research outcomes.</td>
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<td>An understanding and appreciation of the mission and research environment of the Gatsby Unit and SWC, and a commitment to building the reputation of the Gatsby Unit and SWC as world-leading research centres</td>
<td>Essential</td>
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<td>Accountable, reliable and resourceful.</td>
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<td>Works ethically, legally and with integrity</td>
<td>Essential</td>
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Contact Us

Informal enquiries about the post are welcome to Professor Maneesh Sahani, Director, Gatsby Unit
maneesh@gatsby.ucl.ac.uk

If you have any queries relating to the application process please contact Mike Sainsbury
m.sainsbury@ucl.ac.uk

Applying for the Role

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.

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 Unit will provide overseas candidates who may require sponsorship with support in seeking an appropriate visa.

Salary
A competitive starting salary will be paid in line with relevant skills, knowledge, experience and achievement. 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. GCNU & SWC are 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.

GCNU and SWC hold a joint Bronze Athena SWAN award.