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| Job Description | JD178 v2.0 |
| Senior Research Software Developer | Grade: 8 |
| Department: Research IT Services | Location: UCL Bloomsbury campus, London |

#### Reports to

**LONDON’S GLOBAL UNIVERSITY**

Head of Research Software Engineering

**Direct reports**: 0-3 Research Software Developers or Senior Research Software Developers.

#### Context

UCL is a world leading teaching and research university, often ranked in the top ten in the world with an annual turnover of well over £1 billion. Part of UCL’s vision is to take on the hardest global challenges.

In order to deliver this vision UCL has an Information Services Division (ISD) of over 500 staff supplying teaching, research and professional services support. The division covers all central IT services and is split into 8 departments that provide services for local support, operations, project delivery, governance and security.

Within ISD, Research IT Services (RITS) focuses on supporting one of the key missions of the university. We aim to ensure that facilities and services for UCL’s researchers are indeed world leading.

The Research Software Development Group works with researchers across UCL to build and maintain readable, reliable and efficient research software. The team is friendly and diverse, with a range of backgrounds and specialist skill sets represented. There are good opportunities for personal development and career progression within the group, in both technical and managerial tracks. Funding for training and conference travel is also readily available.

#### Main purpose of the job

* Senior Research Software Developers provide tactical leadership for delivery of research software development services, collaborating with research colleagues from across UCL to construct, improve, and maintain codes used for modelling, analysis, simulation and more.
* They are required to rapidly assimilate research context through publications and conversation with research groups, understand the computational algorithms, requirements and interfaces needed within the research effort, and design high-quality software for research colleagues which will result in a sustained impact on their research programme.
* They may follow a technical leadership or managerial pathway, or a blend of both.
* They mentor other team members ensuring the code they produce meets rigorous quality standards, and contribute to the design of the team's ways of working.
* They may line manage up to three other Research Software Developers.
* They coordinate the delivery of collaborative research programming projects, allocating team resources efficiently to ensure timely delivery of research outcomes.
* They contribute to the development and design of teaching and training courses in research programming and related subjects.
* They manage external funding opportunities from initial idea through to successful funding, liaising with funding bodies, UCL Professional Services staff and Principal Investigators, preparing proposal costings and contributing to bid documents.

#### Duties and responsibilities

The balance of time between activities will vary depending on the post holder’s emphasis on a technical leadership or managerial pathway. A single person will not perform all activities. For instance, a tech lead might spend no time on project management or line management. The percentages here give an indication of the relative proportions likely for different areas. They should not be taken as definitive, and do not sum to 100%.

##### Research programming (25%)

* Collaborate with research colleagues from across UCL to construct, improve, and maintain codes used for modelling, analysis and simulation in UCL research.
* Rapidly assimilate research context and understand the computational algorithms, requirements and interfaces involved in a research programming project.
* Contribute to projects on an intellectual as well as technical level.
* Lead on the detailed design of high-quality software for research colleagues which will result in a sustained impact on their research programme(s).
* Follow good software engineering and reproducible research practice and disseminate this practice to collaborating partners.
* Assist colleagues in analysis and problem-solving tasks, sharing knowledge and expertise with team members.
* Mentor other team members ensuring the code they produce meets rigorous quality standards.
* Support the release and dissemination of UCL research software, through open source, scholarly, and commercial channels.
* Explain and document software created with the team’s involvement, contributing to research papers published in the academic literature, project reports and case studies, and code documentation and manuals.
* Provide online and face-to-face user support for software we create or maintain to both UCL and external users.
* Extend expertise in many areas of computational research through both independent study and training courses.

##### Project management (30%)

* Coordinate and lead the delivery of collaborative research programming projects, organising meetings, conducting regular reviews and preparing reports.
* Coordinate and allocate overall team resources efficiently to ensure timely delivery of projects and other tasks.
* Manage the activities of the project team in a matrix management context.
* Be responsible for quality assurance of project outputs.
* Lead the relationships with PIs and collaborators, ensuring clear communication and managing expectations.
* Monitor processes, metrics and dashboards, ensuring that internal and external processes are followed.
* Coordinate code review and issue tracking.
* Prepare and maintain project management documentation for divisional projects.

##### Technical leadership (30%)

* Design overall technical solutions for research software projects.
* Apply a deep knowledge of many relevant technologies to progress particularly large or complex projects.
* In conjunction with the project manager, organise the work of other Research Software Developers on projects.
* Review and revise code and documentation produced by team members, amending as necessary to ensure consistency and quality.
* Contribute to the design of the team’s ways of working, ensuring continuous improvement and adoption of appropriate techniques, technologies and tools.
* Contribute to strategic leadership, working with senior colleagues.
* Maintain and develop expertise in technical leadership and software development processes.

##### Supervision and/or line management of the team (15%)

* Line manage up to 3 Research Software Developers, which may include: performance management and coaching, objective setting, identification and follow-up of training and development needs, and conducting appraisals and probation reviews.
* Participate in interview panels.
* Lead on hiring new team members.

##### Provide training relating to research software engineering (10%)

* Train UCL research staff and students in the effective use of software for research.
* Develop and design training materials in research computing, suitable for a range of audiences with a very variable degree of computational experience.
* Advise researchers on software practices, techniques, design, and architecture.

##### Engage with and contribute to wider research software community (10%)

* Build and maintain relationships within the research and e-Infrastructure communities in UCL and beyond, actively seeking opportunities for collaboration with researchers.
* Source and manage funding opportunities from initial idea through to successful funding, liaising with funding bodies, UCL Professional Services staff and Principal Investigators, preparing proposal costings and contributing to bid documents.
* May develop a personal research agenda.
* Contribute to community activities such as seminars and networking events.
* Attend conferences and community events in a variety of software engineering/research computing fields in the UK and abroad.
* Contribute ideas, experience and thinking to technical working groups in and beyond UCL.
* Represent RITS at University, national and international events, enhancing the recognition and reputation of the Department and the University, and creating opportunities for collaboration.

##### Maintain and support research software development infrastructure and services (10%)

* May act as Service Operational Manager for one or more Research Software Development services.
* Maintain and support the state-of-the-art infrastructure and services needed for effective research software engineering, in areas such as continuous integration, version control, and code review.
* Maintain and manage systems and servers used to deliver software development infrastructure services.
* Author and maintain documentation relating to software development infrastructure services.
* Assist Research IT Services colleagues in the delivery of other departmental services.
* Contribute to the wider ecosystem of support for computational research in UCL and beyond, working with colleagues to help build and maintain integrated systems and services that meet the needs of researchers.
* Contribute to wider departmental and divisional activities through discussions and meetings.
* Liaise effectively with divisional and national colleagues on security, platforms, project management and design matters.
* Deputise as necessary on strategic and governance bodies.

##### Flexible personal allocation (5%)

* A divisional initiative for staff to spend time on their own projects, e.g. contributing to open source software or learning a new technology.

# Person Specification

Note that candidates are often appointed without meeting the ‘Desirable’ characteristics. Also some criteria are specific to a candidate’s preference for a technical leadership or managerial pathway. Such criteria should all be considered Essential for candidates targeting the corresponding pathway, and optional for candidates targeting the other pathway.

| Criteria | Essential or Desirable | Assessment method  (Application/Interview) |
| --- | --- | --- |
| **Qualifications, experience and knowledge** |  |  |
| Graduate degree with a significant computational component. | Essential | A |
| PhD degree in a computationally based field or equivalent professional experience (significant experience programming for Research and Development in an academic or industrial setting). | Essential | A/I |
| Experience of analysing, researching and solving complex programming problems. | Essential | A/I |
| Experience in a number of successfully completed complex technical projects, having had a leading role in bringing about those successes (either technically or managerially). | Essential | A/I |
| Significant experience with at least two programming languages used for research (e.g. C++, Python, C#, R, Java, Javascript, Fortran, Julia) and conversant with more. | Essential | A/I |
| Knowledge of and commitment to software development best practise including issue tracking, testing, documentation, version control and continuous integration. | Essential | A/I |
| Experience using Unix-based operating systems and Unix system tools and utilities. | Essential | A |
| Experience mentoring and leading other programmers (formal line management experience is not essential, but candidates should be able to show they have effectively guided the work of more junior colleagues). | Essential | A/I |
| Knowledge of and experience with common software architectural patterns, multiple diverse technologies, and the design of complex software solutions. | Essential for technical pathway | A/I |
| Experience of technologies supporting software re-use and deployment. | Essential for technical pathway | A/I |
| Experience of leading project management processes, including planning, tracking and risk assessment. | Essential for managerial pathway | A/I |
| Knowledge of agile software development methodologies, such as SCRUM or XP. | Desirable | A |
| Experience designing and/or delivering training courses. | Desirable | A |
| Advanced knowledge of applied mathematics. | Desirable | A |
| Experience of working in a service oriented environment. | Desirable | A/I |
| Operational experience maintaining actively used systems and services, including change and problem management. | Desirable | A |
| Demonstrable leadership in one or more software communities, such as through membership of standards bodies, organisation of community events, or a lead maintainer role for open source tools or packages. | Desirable | A |
| Advanced software process and project management expertise, with knowledge of multiple process frameworks and theories, from a variety of cultures (SCRUM, XP, DSDM, Lean, PRINCE II, ITIL), with an understanding of commonalities and differences. | Desirable for managerial pathway | A/I |
| Experience of the successful management of project budgets. | Desirable for managerial pathway | A |
| **Skills and abilities** |  |  |
| Ability to rapidly acquire fluent knowledge of new programming languages, libraries and platforms. | Essential | A |
| Excellent written and verbal communication skills including the ability to effectively present complex or technical information to a range of audiences. | Essential | A/I |
| Ability to communicate with researchers at a professional level, to ensure their research vision and/or research questions are supported. | Essential | A/I |
| Ability to work collaboratively and as part of a team, including motivating and encouraging colleagues. | Essential | A/I |
| Ability to work under own initiative. | Essential | A/I |
| Proven ability to manage multiple concurrent tasks and activities, working to deadlines and prioritising as appropriate. | Essential | A/I |
| **Personal attributes** |  |  |
| Desire to keep up-to-date and learn about new developments in computational research. | Essential | A/I |
| Motivation to keep up to date with new and emerging project management methods. | Essential for managerial pathway | A/I |

# Appendices

#### Conditions of service

The normal hours of work are 36.5 hours per week. However, this is a senior post and flexibility will be expected in response to varying workload. Reasonable notice will be given and where properly authorised such work will be recompensed as stated in the terms and conditions. The annual leave entitlement is 27 days per year, plus 6 College closure days, plus public holidays.

UCL is committed to flexible working to support a healthy work life balance. A number of types of flexibility will be considered for this role including partial remote working, compressed/flexible hours, and/or a part-time appointment.

#### Additional information

The job description reflects the present requirements of the post, and as duties and responsibilities change/develop, the job description will be reviewed and be subject to amendment in consultation with the post holder. The post holder will carry out any other duties as are within the scope, spirit and purpose of the job as requested by the line manager or Head of Department/Division.

The post holder will actively follow UCL policies including Equal Opportunities policies and be expected to give consideration within their role as to how they can actively advance equality of opportunity and good relations between people who share a relevant protected characteristic and people who do not share it.

The post holder will maintain an awareness and observation of Fire and Health and Safety Regulations.

The post holder 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 Data Protection Act 1998.