

Candidate Information

Position:	Research Software Engineer
School/Department:	Administration Support
Reference:	20/108124
Closing Date:	Monday 2 March 2020
Salary:	£33,797- £40,322 per annum.
Anticipated Interview Date:	Monday 16 March 2020

JOB PURPOSE:

The candidate will work as part of a project team involving Queens University Belfast and Ulster University and be responsible for engaging researchers from multiple disciplines with the Kelvin-2 Tier 2 facilities . He/she will work with researchers to gain a clear understanding of their research challenges, help them design HPC software, and provide necessary support to support researchers to deploy existing code bases and simulations onto HPC.

MAJOR DUTIES:

1. Contributing to researcher's HPC knowledge and skills within the research community at all stages of the research software development cycle and work collaboratively with researchers to transition existing code bases and simulations for deployment on HPC to maximise productivity and research quality.
2. Assist and facilitate the on-boarding of UK-based researchers in gaining access and running applications on the Kelvin-2 Facility by reducing the barrier to entry and ease of use of HPC.
3. Contributing to the design, development, management and support research software and applications for research involving high performance computing including GPU resources, real-time data processing and AI software pipelines.
4. Help to increase the number of HPC users, maximising utilisation and allocation from users internally within each institution, locally within Northern Ireland including industry via Catalyst, and engaging HPC users across the UK in our key priority research themes.
5. Deployment, maintenance and support of research including related Service Desk tickets and troubleshooting incidents and problem and technical documentation.
6. Be a strong advocate for HPC by contributing and/or organising outreach activities to raise awareness and present knowledge of other resources such as the other Tier-2 centres and the national service (ARCHER).
7. Being prepared to travel in connection with the needs of the project and spend periods of research at the premises of collaborating partners.
8. Adopting a professional attitude to the responsibilities and duties of the post, complying with University policies.
9. Performing any other research duties, as assigned by the Principal Investigator, which are compatible with the designation and seniority of the post.

Planning and Organising:

1. Plan own work over the short to medium term with an awareness of longer term issues, in response to manager's general instructions.
2. Contribute to larger projects as part of a project team.
3. Contribute to the planning and organisation of service changes with regard to their impact on the business of the University.
4. Develop appropriate work schedules in order to meet targets and/or turnaround times.

Resource Management Responsibilities:

1. Assist in the planning of resources within the area of responsibility to ensure that they are effectively managed and monitored.
2. Advise on the cost/benefit of new and existing technologies.
3. Assume delegated responsibilities as appropriate.

Internal and External Relationships:

1. Attend internal and external meetings to ensure that relevant issues are appropriately represented and reported.
2. Liaise with key contacts to ensure appropriate integration, collaboration and understanding.
3. Liaise with external suppliers, consultants and other third parties.

ESSENTIAL CRITERIA:

1. * Degree (2.1 or higher) in Science, Engineering or Computing, or a closely related discipline, or a higher degree in the same or closely related subjects.
2. Experience in one or more of the following:-
 - * Excellent programming and software engineering skills with knowledge and proven experience of using industry standard software.
 - * Experience of compiling and supporting a range of complex and modern software on Linux.
 - * Experience of optimising the performance of a software system.
3. * Evidence of an ability to mentor users on the adoption of modern software tools.
4. * Experience of working within a research team and/or software development team.
5. * Ability to quickly understand research and/or project objectives and contribute to successful outcome of projects.
6. * Contributing to the investigation of new research approaches and/or new software pipelines.
7. Ability to clearly communicate in English, orally and in writing.
8. Excellent presentation skills in English.
9. Passionate about computing/programming and ability to work unsupervised and independently over extended periods of time, to deliver results, meet deadlines and to achieve agreed targets.
10. Ability to work collaboratively and flexibly as an integral part of a multidisciplinary research team.
11. Willingness to travel locally and internationally as required by the post.
12. High motivation and ability to learn new knowledge and skills.

DESIRABLE CRITERIA:

1. * PhD in a relevant area.
2. * System administration of a number of networked servers running Linux.
3. * Providing technical user support.
4. * Experience of working in either industry or research institute as a data analyst, software developer or researcher.
5. * High level analysis, design and problem-solving skills.
6. * Certifications in one or more of the following Linux, programming, networking, storage technologies.
7. * Experience working on High Performance Computing clusters.
8. Experience of presenting at conferences to a large diverse audience.
9. Access to own transport or means to fulfil the mobility requirements of the post.

ADDITIONAL INFORMATION:

The proposed aims are to establish a £5M Kelvin-2 HPC centre involving Queen's University Belfast and Ulster University for which £2.1M is being sought from EPSRC. It will have significant impact for science, by expanding the use of HPC to new pools of talent and new areas of investigation; for Northern Ireland, by building on the strong collaboration between Ulster and Queen's already established through two major city deal initiatives, and their approach to enterprise with regional investment agencies and commercial enterprises; and a strong foundation for HPC within the UK, building further capacity and interactions with critical stakeholders and linking to non-commercial stake-holders to address societal challenges.

The platform will offer 8000 AMD-based CPU cores and 32 GPU nodes with a high performance 2 Petabyte of scratch storage interconnected via a high-speed network. Different to other sites, it employs Dell-based technology which offers impressive performance with low running costs. The inclusion of GPU will support AI-based research reflecting the institutions' joint strength, recently ranked as 6th in the UK in terms of research power in the a recent government report produced by the Alan Turing Institute. Kelvin-2 is focused on introducing new aspects of HPC modelling for neurotechnology and computational neuroscience, advanced chemistry, innovative drug delivery, precision medicine, metabolomics and hydrogen safety, many of which fit with UKRI's strategic plans in healthcare and new energy.

Six ambitious research exemplar projects that are directly associated with strategically important research centres in both institutions, are proposed. These will account for 28M and 570M wall-clock hours of CPU and GPU respectively which will constitute 40% of the total Kelvin-2 resource. 35% of the processing time will be dedicated to supporting general users for the national Tier-2 service, with the remaining resource allocation for new projects. By a programme of communication, this aim is to highlight the potential of HPC to the specific communities in the UK. The facility will be managed by a director with strong commercial sector experience and two principal applicants with excellent track record in multidisciplinary research and commercialization.

Two dedicated research software engineers will be employed to support the research and engagement with the community. The team will be supported by a team of experts from each domain, staff with considerable HPC expertise and Prof. Simon McIntosh-Smith, a UK academic with considerable computational science experience from running an existing EPSRC HPC Tier-2 site, and Professor Newton Howard, Professor of Neurocomputation,

Neurosurgery and Mathematics at the University of Oxford where he directs the Computational Neuroscience Laboratory. A Resource Allocation Panel will be established to review and allocate the resources, meeting on a quarterly basis. A £3M resource will be provided by the universities to support Kelvin-2 in the form of management, network/operational staff, new hardware and data centre. We will aim to expand our international links specifically with the 13k-node/63TiB platform at ICHEC and HPC facilities/expertise at Virginia Tech. and Lawrence Livermore National Lab and increase our presence at the main HPC conferences, e.g. Supercomputing.

The Tier-2 Computing infrastructure is central to two separate, major city deals in Northern Ireland focused on economic competitiveness, innovative projects and job creation targeted at health/life sciences and agri-food. These are due to start in 2021 and will provide a guaranteed refresh cycle of Kelvin-2 in the 2023/25 period, thus minimising any subsequent capital requests to EPSRC. Broad engagement will be ensured from the universities' strong track record in engagement with industry and spin-outs.