Graduate Research Software Engineer
Department of Environment and Geography

Closing date: 6 October 2019

Interview date: Week commencing 21 October 2019 (provisional)

Vacancy reference: 8003
INTRODUCTION

The Environmental Modelling Research Group is a vibrant and supportive research group within the Department of Environment and Geography at the University of York. The group has a passion for using cutting-edge software and numerical techniques in environmental contexts to solve real-world problems. We work with a wide group of collaborators on a range of issues in the geological past, the present and the future. The group is an ardent user of open source software wherever possible and making sure our research is made as accessible as possible.

The advertised post of graduate research software engineer (grade 5) is associated with an industry funded project between Petrobras (Brazilian state-owned petroleum company) and the Universities of York and Bristol. The overall project aims to use an existing research software to examine how sediments offshore of Brazil have formed. The key aspects to this post are optimisation, development and maintenance of the existing research software, writing documentation and training materials, and communicating progress and results to project partners. The post will also involve the implementation and testing of new algorithms as designed by the research team. The role is therefore suited to a scientist with software development experience or a software developer with an interest in natural sciences. You will be managed by the University of York principle investigator, but work closely with researchers at the University of Bristol and Petrobras.
Main purpose of the role

The main purpose of this role is to refactor and optimise existing software. This involves creating a modern software development environment around an existing software base, including use of revision control and test-based development. The role involves working with academics and other researchers to implement new algorithms designed by them and ensure correct functionality. Optimising the code will involve identifying performance bottlenecks by profiling and refactoring code to increase performance. The code will be managed in revision control code repositories. The role will also involve writing and maintaining documentation and websites. Finally, the role also involves contributing to new documentation, tutorials, and workshops on using the software for project partners.

Key responsibilities

(Role holders will be required to undertake some or all of the duties below)

- Refactor and optimise existing research code, which includes re-writing exiting code along modern coding standards (including test-based development), profiling code to find performance bottlenecks, and increasing code performance.
- Update and improve documentation, including in-code documentation, developer documentation, and end-user documentation in a variety of formats.
- Write regular reports on progress for stakeholders.
- Maintain the software via version control systems, such as Git, including maintaining branches for different stakeholders, including incorporating code from stakeholders in a reliable and maintainable way.
- Maintain the software’s website and documentation to enable end-users and project partners to use the code.
- Contribute to the design and run workshops and tutorials on using the software for project partners and future developers within the wider remit of the project. This includes being given brief talks and explaining to stakeholders how to set-up, run and post-process simulations.
- Implement new algorithms as designed by the research team in the research code and incorporating tests to ensure correct code functionality. This will include working closely with project team members on functionality required.
## Qualifications

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<th>Essential / Desirable</th>
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<td>2:1 BSc or equivalent in a numerate subject</td>
<td>Essential</td>
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<td>MSc or equivalent in a numerate subject</td>
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## Knowledge

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<tr>
<td>Knowledge of modern software development techniques</td>
<td>Essential</td>
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<td>Background in natural sciences</td>
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<td>Knowledge of, and experience with, object-oriented design, design patterns and refactoring.</td>
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<td>Knowledge of scripting languages, such as Python, Matlab or IDL</td>
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## Skills, abilities and competencies

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<td>Flexibility under pressure and in adapting to changing needs</td>
<td>Essential</td>
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<td>Ability to work collaboratively and as part of a team</td>
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<td>Able to work with minimal supervision</td>
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<td>Able to communicate to a high standard orally and in writing to a broad range of audiences at all levels</td>
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<td>Expertise in parallelising software</td>
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<td>Ability to manage code through version control and deployment systems</td>
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## Experience

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<td>Experience of working on collaborative software projects</td>
<td>Essential</td>
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<td>Experience designing and/or delivering training courses</td>
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<td>Experience of technologies supporting software re-use and deployment</td>
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<td>Experience working with scientific research codes</td>
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## Personal attributes

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<td>Open to collaborative ways of working; enjoys working with people</td>
<td>Essential</td>
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<td>Knowledge of, and commitment to, software development best practise including issue tracking, testing, documentation, version control, and continuous integration</td>
<td>Essential</td>
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<td>Self-motivated, showing initiative</td>
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<td>Clear communicator across a range of media</td>
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<td>High levels of accuracy and attention to detail</td>
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THE DEPARTMENT

The role holder will be part of the vibrant and supportive Environmental Modelling Research Group (EMRG: https://envmodellinggroup.github.io/). As a group we look at natural hazards, such coastal and river flooding, and tsunamis, as well as sedimentological processes, including reefs and carbonates. We study these in the geological past, present and future. This diverse and inclusive group has a passion for environmental research and will give the post holder a great opportunity to form lasting professional relationships. The postholder will also interact with undergraduate dissertation students, masters students, PhD students, postdoctoral researchers and academic members of staff at the University of York, researchers at the University of Bristol and Petrobras, as well as the wider academic community.

The Department of Environment and Geography was established in 1992 to develop and disseminate the approaches required to address the complex environmental challenges facing society. Our guiding principle is that issues of sustainable development demand interdisciplinary research across the interface between natural, physical and social sciences. This interdisciplinary ethos is unique among university departments in the UK and the Department has established an international reputation for excellence and innovation at the forefront of environmental research. Our strength is augmented by the embedding of the Stockholm Environment Institute at York (http://www.york.ac.uk/sei/) into the Department and the establishment of the York Environmental Sustainability Institute (YESI) (http://www.york.ac.uk/yesi/) YESI has been created to ensure that York’s world-leading researchers can operate in an interdisciplinary setting to undertake the research needed to address major environmental issues. YESI incorporates environmental research across the Departments of Archaeology, Biology, Chemistry, Environment & Geography, Politics, Sociology, Social Policy and Social Work, and the York Law School. It integrates environmental research across these departments to tackle the major themes of: (1) Future food and fuel; (2) Global change; and (3) Sustainable environments.

The interdisciplinary mission of the Department of Environment and Geography is founded on a mix of environmental science, ecology, human and physical geography and environmental economics and policy. Research within the Department is focused within three clusters: Earth Systems and Environmental Change; Ecosystems and Society; and Environmental health. All members of academic staff participate in the activities of at least one of the three research clusters in order to promote collaboration and knowledge exchange across the Department. All research themes have major impacts on national and international environmental policy, helping to shape the debate in a diversity of policy arenas. Our staff advise global policymakers including UNEP, FAO and WHO, support international NGO’s such as WWF, and sit on national and international expert committees.
THE DEPARTMENT

The Department has a reputation as a friendly and collegiate place to work and study and this is frequently commented on by new staff, visitors and students via feedback such as the National Student Survey. The University as a whole matches this ethos. It has retained a very flat management structure that actively encourages cross-departmental collaboration and seeks to remove any obstacles to cross-disciplinary working.

The Department is committed to supporting equality and diversity for all staff and students and recently (2014) successfully applied for a bronze Athena SWAN award for promoting women in science. The Athena SWAN Charter recognises and celebrates good employment practice for women working in science, engineering and technology (SET) in higher education and research. The Department operates a set of family-friendly policies. Staff working patterns are flexible and a formal flexible working scheme is also in operation. The Department has a maternity and paternity leave policy to help provide support for staff and the University has a nursery and a Child Care voucher scheme. Social events are held for all categories of staff.

The Department provides support for all categories of staff in their applications for promotion, role reviews, awards and prizes and rewarding excellence nominations. The Department strives to address gender inequalities and ensure that there is a culture that supports equality and encourages better representation throughout the department. Support for women at all stages of their career is recognised as being extremely important.

DEPARTMENTAL RESEARCH

The Department conducts world-leading research on topics of global environmental importance. The impact of our research in ecology and environmental science is ranked 2nd in the UK and 17th in the world (THES). Our research is highly interdisciplinary across the natural and social sciences, ranging from atmospheric chemistry to environmental economics and policy analysis. Our funding comes from numerous sources, including research councils, national and international government agencies, charities and industry.

TEACHING PROGRAMMES

The Department offers four undergraduate degrees: BSc in Environmental Science; BSc in Environmental Geography; BSc in Environment, Economics and Ecology; and a BA in Human Geography. At the postgraduate level, we offer four MSc programmes: Environmental Science and Management; Corporate Social Responsibility and Environmental Management; Environmental Economics and Environmental Management and Marine Environmental Management, alongside a comprehensive MPhil/PhD programme. We currently have 25 academic staff and just over 300 undergraduate students, 60 postgraduate students and 50 PhD students.
THE DEPARTMENT

STOCKHOLM ENVIRONMENT INSTITUTE AT YORK

The Stockholm Environment Institute at York is one of six constituent centres of SEI, an independent, internationally renowned research organisation committed to the implementation of practices supportive of global sustainable development. The Swedish Government established the Stockholm Environment Institute in 1989 with the goal of encouraging sustainable development by linking basic scientific research and policy making. SEI has established an international reputation for rigorous and objective scientific analysis in the field of environment and development and has been recognised as one of the world's top ten environmental 'think tanks' (fpri.org).

The SEI-York centre has over 30 core members of staff from a variety of disciplines. In addition to research, they supervise postgraduate research students and participate in undergraduate and postgraduate teaching (http://www.york.ac.uk/sei/).

Further information about the department is available at: http://www.york.ac.uk/environment/

The SEI-York centre is located within the Department of Environment and Geography at the University of York. In the UK, SEI-York has concentrated on issues related to consumption, production, individuals' behaviour and the impacts of our affluent society on the environment. In developing countries, SEI-York staff work on atmospheric issues, from air pollution in urban centres, to regional air pollution and its interaction with climate change. In Africa and Asia, York staff work at local scales, attempting to improve management of water resources in arid areas to improve agricultural yields.
Founded on principles of excellence, equality and opportunity for all, the University of York opened in 1963 with just 230 students. In 2019 it is the home of more than 18,000 students across more than 30 academic departments and research centres. Since opening over fifty years ago, we have become one of the world’s leading universities and a member of the prestigious Russell Group.

We are consistently recognised as one of the leading Higher Education Institutes and one of just six post-war universities to have appeared in the world top 100. We were rated 22nd in the 2019 Times & Sunday Times league table. The University of York has won six Times Higher Education (THE) Awards and five Queen’s Anniversary Prizes.

The University is proud of its association with Athena SWAN, holding multiple awards in support of gender equality, representation and success for all, with gold awards for Chemistry and Biology and a University-wide bronze award.

Of 154 universities that took part in the Research Excellence Framework (REF) in 2014, The University of York ranked 14th overall and 10th for the impact of our research. The University is consistently in the top ten UK research universities and attracts over £60m a year of funding from research alone.

Our vision is to make the University of York a world leader in the creation of knowledge through fundamental and applied research, the sharing of knowledge by teaching students from varied backgrounds and the application of knowledge for the health, prosperity and well-being of people and society.
Attractive workplace

Centred around the picturesque village of Heslington on the edge of the city of York, our colleges are set in an attractive landscaped campus. York enjoys a safe, friendly atmosphere with facilities including bars, shops, theatres and concert halls all within easy walking distance.

The University has undergone an unprecedented period of expansion and renewal since 2000. We have invested in twenty new buildings on the original campus and have completed the first and second phases of a £750m campus expansion. Our investment in new colleges, teaching and learning spaces, laboratories, research facilities and a new sports village mean there has never been a better time to join us.

During this period of change we’ve worked hard to retain our friendly, informal and collegiate atmosphere, which is important to our core values of inclusivity and interdisciplinarity.

We have a thriving international community and are committed to providing staff moving to York with as much support as possible through our Relocation Package and Welcome Officers.

The University is committed to promoting a diverse and inclusive community - a place where we can all be ourselves and succeed on merit. We offer a range of family friendly, inclusive employment policies, flexible working arrangements, staff engagement forums, campus facilities and services to support staff from different backgrounds.

For further information please visit our employee benefit pages
THE CITY AND THE REGION

The City of York

Internationally acclaimed for its rich heritage and historic architecture, York’s bustling streets are filled with visitors from all over the world. Within its medieval walls you will find the iconic gothic Minster, Clifford’s Tower and the Shambles - just a few of the many attractions.

But York isn’t just a great place to visit - it’s also a great place to live and work. While nourishing a vibrant cosmopolitan atmosphere, York still maintains the friendly sense of community unique to a small city.

Visit www.visityork.org for more information on the city of York.

Shopping, culture and entertainment

York boasts specialist and unique boutiques but also all the high street stores on its busy shopping streets. Alongside them you will find cinemas, theatres, an opera house, art galleries, a vast range of restaurants, live music venues and clubs. York is particularly renowned for its multitude of pubs and bars, from the modern to the medieval.

Housing and schools

Whether you choose to live close to the city, in one of the surrounding villages or further afield, you will find a wide range of housing within comfortable distance of York and the University. For families, the area has a range of excellent schools both in the state and independent sector.

Great location

York is one of Britain’s best-connected cities. Halfway between London and Edinburgh on the East Coast mainline, on intercity trains you can reach London King’s Cross in less than two hours and Edinburgh in two and a half hours. York is also well served by road links, and it is easily accessible from the A1, M1 and the M62.

For those travelling from overseas, Manchester Airport is two hours away and Heathrow Airport just three and a half. Flights from nearby Leeds Bradford Airport provide easy access to mainland Europe. By Eurostar from London St Pancras, Paris is just over six hours away.

Yorkshire

The Lonely Planet guide recently declared Yorkshire the third best region in the world to visit. There is something to cater to every taste, whether it be the rugged landscapes of the Moors or the Dales, the picturesque seaside towns of Scarborough and Robin Hoods Bay, the gothic architecture of Whitby or the vibrancy of cosmopolitan Leeds.
Apply online

- Go to https://jobs.york.ac.uk
- Find this job using reference 8003
- Complete the online application form

You will need to submit your completed application by midnight (local UK time) on 6 October 2019.

What will I need?

We will ask you for details of:

- your employment history
- relevant qualifications
- two referees

You need to be ready to show us how you meet the requirements of the job, either in a written statement and / or by answering questions.

Help and assistance

Please direct any informal queries to:

Dr Jon Hill: jon.hill@york.ac.uk

If you have any informal queries about your application, contact the HR Services team:

recruitment@york.ac.uk
+44 (0)1904 324835