KTP Research Associate on Model-Based Software Engineering with Rolls Royce

Computer Science

Closing date: 1 June 2018

Interview date: to be confirmed

Vacancy reference: 6610
INTRODUCTION

This post is associated with a new Knowledge Transfer Partnership (KTP) between Rolls-Royce and the University of York. The aim of the KTP is to design and implement methods and tools that enable collaborative and scalable model-based development of aerospace control systems in Rolls-Royce.

Control systems products are developed to the very highest safety, or 'Criticality Level', reserved for parts of an engine which, were they to fail, would have a catastrophic effect on the aircraft. The development of these systems is extremely expensive. The size and complexity of these systems is increasing due to the customer requirements for cleaner, greener aircraft that burn more efficiently and therefore cost less to run. At the same time Rolls-Royce are delivering more projects concurrently and customer timescales are ever shorter.

The company has developed a strategy to reduce the costs and timescales of software development and this relies heavily on the full adoption of model-based software engineering techniques. The current model-based engineering platform used at Rolls-Royce is largely based on UML and closed proprietary technologies, and is due for redesign and modernisation to make full use of the capabilities offered by modern domain-specific language workbenches and model management technologies. The aim of this project is to contribute to the design, development and deployment of a scalable and collaborative platform for model-based software engineering in Rolls-Royce based on open standards and open-source technologies.
Main purpose of the role

- To work within a Rolls-Royce R&T team to evaluate and select open technologies and to develop tools through which Rolls-Royce will be able to migrate from their current proprietary modelling environment to a standards-compliant model-based engineering environment
- To select and adapt technologies that will enable seamless collaborative modelling in the new environment
- To develop facilities for validating, transforming and verifying models of aerospace systems in a scalable manner

Key responsibilities

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

- Understand existing development processes and product architecture at Rolls-Royce
- Become familiar with the respective regulatory environment
- Evaluate standards-based modelling frameworks (e.g. the Eclipse Modelling Framework) and domain-specific language workbenches (e.g. Sirius, Xtext)
- Evaluate techniques and tools for scalable version control of models (e.g. Git, Hawk, Eclipse CDO)
- Develop domain-specific languages and/or UML profiles that can support the development lifecycle of aerospace systems
- Assemble a collaborative modelling methodology and an integrated technical offering that can be used by Rolls-Royce engineers
- Design and implement automated model management facilities for the models involved in the lifecycle of aerospace systems (e.g. model transformation, code generation, impact analysis, traceability management)
- Deliver training to Rolls-Royce engineers
- Manage the budget and plan with respect to the KTP
- Organise meetings with the KTP assessor

At a glance

<table>
<thead>
<tr>
<th>Salary</th>
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</tr>
</thead>
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<tr>
<td>Hours of work</td>
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<td>Contract type</td>
<td>Fixed-term contract for 36 months.</td>
</tr>
<tr>
<td>Based at</td>
<td>Rolls-Royce, Victory House, Victory Rd, Derby</td>
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JOB DESCRIPTION

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# PERSON SPECIFICATION

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<tr>
<th>Qualifications</th>
<th>Essential / Desirable</th>
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<tbody>
<tr>
<td>Masters in Computer Science (or a related subject)</td>
<td>Essential</td>
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<tr>
<td>PhD in Computer Science or equivalent experience</td>
<td>Desirable</td>
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<th>Knowledge</th>
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<tr>
<td>Good understanding of software and systems engineering</td>
<td>Essential</td>
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<tr>
<td>Knowledge of the SysML/UML modelling languages</td>
<td>Desirable</td>
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<tr>
<td>Good understanding of version control systems (e.g. Git, SVN)</td>
<td>Desirable</td>
</tr>
<tr>
<td>Knowledge of the Eclipse Modelling Framework</td>
<td>Desirable</td>
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<tr>
<td>Knowledge of the Papyrus open-source UML tool</td>
<td>Desirable</td>
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<tr>
<td>Knowledge of EMF-based model-based engineering technologies (e.g. Xtext, Sirius, Epsilon)</td>
<td>Desirable</td>
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<tr>
<td>Understanding and appreciation of principles of safety critical systems</td>
<td>Desirable</td>
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<th>Skills, abilities and competencies</th>
<th>Essential / Desirable</th>
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<tr>
<td>Strong object-oriented design and development skills</td>
<td>Essential</td>
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<tr>
<td>Highly developed communication skills to engage effectively with a wide ranging audience, both orally and in writing, using a range of media</td>
<td>Essential</td>
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<tr>
<td>Ability to write up research work for publication in high profile journals and engage in public dissemination</td>
<td>Essential</td>
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<tr>
<td>Ability to develop research objectives, projects and proposals for own and joint research, with the assistance of a mentor if required</td>
<td>Essential</td>
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<tr>
<td>Competency to conduct individual and collaborative research projects</td>
<td>Essential</td>
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<td>Competency to make presentations at conferences or exhibit work in other appropriate events</td>
<td>Essential</td>
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## PERSON SPECIFICATION

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<th>Experience</th>
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<td>Experience of carrying out both independent and collaborative research</td>
<td>Essential</td>
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<tr>
<td>Ability to work as part of a team and also to work independently using own initiative</td>
<td>Essential</td>
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<tr>
<td>Experience in writing high-quality technical documentation</td>
<td>Desirable</td>
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<tr>
<td>Experience of writing up research work for publication</td>
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### Personal attributes

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<tr>
<td>Attention to detail and commitment to high quality</td>
<td>Essential</td>
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<tr>
<td>Collaborative ethos</td>
<td>Essential</td>
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<tr>
<td>Interest in and enthusiasm for the subject matter of the project(s)</td>
<td>Essential</td>
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<tr>
<td>Positive attitude to colleagues and students</td>
<td>Essential</td>
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<tr>
<td>Willingness to work proactively with colleagues in other work areas/institutions</td>
<td>Essential</td>
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<tr>
<td>Ability to plan and prioritise own work in order to meet deadlines, including using initiative to plan research programmes</td>
<td>Essential</td>
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<tr>
<td>Commitment to personal development and updating of knowledge and skills</td>
<td>Essential</td>
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THE DEPARTMENT

The Department of Computer Science of The University of York, is a global leader in research and knowledge transfer in the field of model-based software and systems engineering, and ranked joint 7th (with Oxford) in the UK in the last national research assessment exercise (REF 2014).

You will be employed by The University of York, but you will be based primarily at Rolls-Royce in Derby, with visits to the company's others sites as required. The Department of Computer Science of The University of York, is a global leader in research and knowledge transfer in the field of model-based software and systems engineering, and ranked joint 7th (with Oxford) in the UK in the last national research assessment exercise (REF 2014).
THE UNIVERSITY

Founded on principles of excellence, equality and opportunity for all, the University of York opened in 1963 with just 230 students. In 2018 it is the home of more than 17,000 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 are ranked 16th in the Times & Sunday Times league table (2017). 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 12 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 6610
- Complete the online application form

You will need to submit your completed application by midnight (local UK time) on 1 June 2018.

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

Direct any informal queries to dimitris.kolovos@york.ac.uk

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

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