KTP Research Associate in Software Development for the Non-Invasive Detection of Bladder Cancer

Department of Mathematics

Closing date: 21 April 2019
Interview date: To be confirmed
Vacancy reference: 7471
INTRODUCTION

This post is associated with a new Knowledge Transfer Partnership (KTP) between Paraytec Ltd and the University of York. The KTP centres around the development of sophisticated image analysis algorithms for detection of bladder cancer cells in urine samples.

Paraytec is a York based scientific instrument company designing, developing and manufacturing the award-winning range of ActiPix ultra violet (UV) area imaging detectors. The detectors use capillaries or area detection in conjunction with sophisticated optics and Active Pixel image sensors, resulting in high sensitivity UV detection for use in a variety of life science application areas. More information can be found at www.paraytec.com

In 2018, Paraytec Ltd collaborated with Professor Julie Wilson at the University of York Mathematics Department on an Innovate UK funded R&D project titled ‘A novel instrument for the analysis of urine for the non-invasive detection of bladder cancer.’ Software algorithms were written to detect the presence of bladder cancer cells in urine samples using Paraytec’s detection hardware. The KTP will continue this work in order to take forward the software already developed.

The KTP Associate will have a £4,000 training budget as part of the post. In addition, the KTP programme will provide training in key areas of leadership management and skills relevant to managing a commercial project.
Main purpose of the role

The Associate will join the small, highly qualified R&D team at Paraytec working on development of the bladder cancer test. They will focus on the software aspects of the project. Specifically:

1. To further enhance and expand the image processing algorithms, including object classification strategies and methodology.
2. To develop the robustness of the software to ‘real world’ situations and its final implementation with the detection hardware.
3. To co-ordinate with the commercial software development company which will be developing the GUI and data output format.

Key responsibilities

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

The successful applicant will have the ability to take full responsibility for the software design process from the current stage of development, through implementation of a code management system with version control and documentation, to handover of a fully tested integrated working system. Throughout the project they will be responsible for:

- Creation and testing of the system design;
- Design of test protocols to validate hardware/software changes;
- Identification of technological risks;
- Working within the team to develop metrics from output data and incorporation into a GUI for clinicians;
- Leading development of an integrated hardware/software prototype;
- Protocol design for validation of clinical results, including success/fail criteria for comparison with methods currently used by clinicians;
- Ongoing improvements to software/hardware based on user feedback and analysis of results;
- Project dissemination at conferences/trade shows;
- Publications/patent applications and final project report.
# PERSON SPECIFICATION

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<tr>
<th>Qualifications</th>
<th>Essential / Desirable</th>
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<tr>
<td>Masters’ degree or higher or equivalent experience in computer science, mathematics or other relevant discipline.</td>
<td>Essential</td>
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<tr>
<th>Knowledge</th>
<th>Essential / Desirable</th>
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<tr>
<td>Software engineering and design</td>
<td>Essential</td>
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<td>Software/hardware integration (e.g. implementation in FPGAs)</td>
<td>Desirable</td>
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<td>Image processing</td>
<td>Desirable</td>
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<td>Embedded systems</td>
<td>Desirable</td>
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<td>Parallel processing</td>
<td>Desirable</td>
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<td>Graphical user interface design</td>
<td>Desirable</td>
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<th>Skills, abilities and competencies</th>
<th>Essential / Desirable</th>
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<td>The capability to work collaboratively as part of a multidisciplinary team (from other software and hardware engineers to medical clinicians).</td>
<td>Essential</td>
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<td>Strong organisational skills to take project ownership, co-ordinate work-streams and achieve agreed objectives.</td>
<td>Essential</td>
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<td>Strong communication skills to engage effectively with a variety of audiences, both orally and in writing, using a range of media.</td>
<td>Essential</td>
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<td>Self-motivated and confident with good persuasion and negotiation skills</td>
<td>Desirable</td>
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<th>Experience</th>
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<td>Experience with commercial standards of computer coding (the application is currently written in C) is central to the role.</td>
<td>Essential</td>
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<td>Project management/organisation</td>
<td>Desirable</td>
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<td>Experience in statistical data analysis and machine learning.</td>
<td>Desirable</td>
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<th>Personal attributes</th>
<th>Essential</th>
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<td>Attention to detail and commitment to high quality of work.</td>
<td>Essential</td>
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<td>Collaborative ethos and positive attitude to colleagues.</td>
<td>Essential</td>
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<td>Interest in and enthusiasm for the subject matter of the project.</td>
<td>Essential</td>
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<td>Ability to plan and prioritise work in order to meet deadlines.</td>
<td>Essential</td>
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<td>Self-motivation and good persuasion and negotiation skills</td>
<td>Essential</td>
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<td>Commitment to personal development and knowledge/skills update.</td>
<td>Essential</td>
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THE DEPARTMENT

The Department of Mathematics at the University of York - one of the 24 members of the Russell group - employs around 50 academics, twelve research and ten administrative staff, and combines mathematical and interdisciplinary research excellence with high-quality undergraduate and postgraduate teaching. In the most recent Research Excellence Framework (REF 2014) 80% of our profile was judged as 4* or 3*. In the 2017 National Student Survey (NSS), the department came first among all Russell Group Universities for student satisfaction.

On average, academics spend about 40% on research and 60% on teaching and administration. Academic members of staff are actively encouraged to take up opportunities for promotion and professional development including sabbatical leave. New members are allocated a mentor and they are given a reduced teaching and administration load for the first one or two years.

The department actively supports the goals of the Good Practice Scheme set up by the London Mathematical Society. This means that the department subscribes to the idea of providing a fair and inspiring environment in which both staff and students can reach their full potential. In 2015, the department received an Athena SWAN Bronze Award which acknowledges its efforts to support the careers of women and other groups underrepresented in mathematics.

Mathematics Teaching at York

The department has about 650 undergraduates across single-subject and combined-honours programmes. Each student is assigned a supervisor overseeing the student’s academic progress and general welfare. The department participates in the Natural Sciences programme jointly with various science departments and the Actuarial Science programme jointly with the York Management School, as well as a taught MSc in Financial Engineering jointly with the Department of Economics. There are about 130 graduate students across five MSc programmes and nearly 60 students are enrolled in a PhD programme.

Teaching is mainly by means of lectures, with small-group tutorials, seminars or problems classes supporting each module. A typical teaching load includes three modules of 18 lecture hours each, as well as tutorials and seminars over a 30-week year. Administrative responsibilities are shared across all members of the department. Staff also supervise student projects, some of which (those for taught postgraduate programmes) run over the summer months.

Mathematics Research at York

The principal research groups in the department are Algebra, Geometry and Analysis, Mathematical Finance and Stochastic Analysis, Mathematical Biology and Chemistry, Mathematical Physics, Number Theory, and Statistics and Probability.

The Associate will join the Statistics and Probability research group, working with Prof Julie Wilson in applied statistics.
THE UNIVERSITY

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 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](http://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 7471
- Complete the online application form

You will need to submit your completed application by midnight (local UK time) on 21 April 2019

What will I need?
You will need to upload:
- your CV
- a letter describing how you meet the requirements of the job

You will also need details of 2 referees.

Help and assistance
Direct any informal queries to Rukmal Abeysekera
rukmal.abeysekera@york.ac.uk

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

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