KTP Associate in Adaptive Vision Systems
Research and Enterprise

Closing date: 30 April 2019
Interview date: TBC
Vacancy reference: 7492
INTRODUCTION

This post is associated with a new Knowledge Transfer Partnership (KTP) project between Nocturna Ltd. and the Department of Electronic Engineering at the University of York. The aim of the project is to develop a novel device for the adaptive acquisition and selective filtering of images from cameras with controlled target illumination. The research focus of this post is on design optimisation of control circuits and system architecture of adaptive vision systems. Engineering challenges will be system design as well as development of an intuitive human-device-interface.

Nocturna Ltd. is part of the Queens Award for Enterprise: International Award Winner 2016, IRNV Group based in York, UK. We specialise in innovative and cutting edge infra-red night vision equipment. Nocturna and related companies have been providing night vision solutions to the global market since 2012 and have a loyal customer base who value continuous innovation in night vision technologies and product design. This research and development project has arisen from a commercial need to investigate the potential of new imaging and illumination technologies beyond the current capabilities and capacities of current state of the art.

Through this KTP, you will work closely with our team who invents, designs, develops, manufactures and delivers to the world market place from our UK base through an established global distribution network. The research and development team consists of mechanical designers and systems engineers with strong links to key contractors and development resources in-group and contracted. The R&D department reports directly to the board of directors and is tasked with continuous improvement of existing products, innovation using the current technology base and developing new products and technologies inside and related to our core night vision technologies.
Main purpose of the role

- To manage the Knowledge Transfer Partnership and utilise the opportunities presented from both Nocturna and University of York.
- To research available technologies in the camera and illumination fields with the aim of selecting suitable candidate assemblies to develop a proof of concept platform.
- To design, assemble and evaluate a proof of concept platform with regards to current and potential performance parameters and control requirements.
- To understand, summarise, collate and store accessibly information on the technologies under investigation to allow informed decisions by stakeholders current and in future.

Key responsibilities

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

- Involve yourself in self-directed research into the capability of existing components, proposals of systems and investigation using prototyping of test-bed systems to determine technical and commercial viability.
- Understand the core technologies of imaging systems, their control and optimisation.
- Understand and develop timing and synchronisation control systems for multiple modules with differing characteristics.
- Develop the company knowledge base on these topics.
- Advance the development to a fieldable proof of concept stage.
- Characterise the key technical challenges and controlling parameters of the technologies to determine a realisable performance specification.
- Work with the company to provide insights from the knowledge base to diverse imaging and illumination issues.
- Coordinate information from the University and Nocturna to inform the technical and commercial aspects of the proposed device.
- Resolve emerging challenges from the technologies and systems in use.
- Deliver training and documentation to Nocturna staff and consultants.
# PERSON SPECIFICATION

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<tr>
<th>Qualifications</th>
<th>Essential / Desirable</th>
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<tbody>
<tr>
<td>Master’s in Computer Science, Electronics, Physics, Instrumentation (or related subject)</td>
<td>Essential</td>
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<tr>
<td>PhD in Computer Science, Electronics, Physics, Instrumentation (or related subject)</td>
<td>Desirable</td>
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<tr>
<th>Knowledge</th>
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<tr>
<td>Good understanding of electronic systems and software engineering</td>
<td>Essential</td>
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<tr>
<td>Knowledge of imaging technology, camera systems or related devices</td>
<td>Essential</td>
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<td>Knowledge of product development processes in electronic circuit and PCB design</td>
<td>Essential</td>
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<td>Knowledge of embedded systems programming</td>
<td>Essential</td>
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<td>Knowledge of camera control circuits for exposure/shutter synchronisation</td>
<td>Desirable</td>
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<td>Understanding of control systems interfaces and human machine interfaces</td>
<td>Desirable</td>
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<td>Understanding of analogue circuit design/optimisation/tuning</td>
<td>Desirable</td>
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<tr>
<td>Understanding of spreadsheets, e.g., as in Excel or Google Sheets</td>
<td>Desirable</td>
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<th>Skills, abilities and competencies</th>
<th>Essential / Desirable</th>
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<td>Highly developed communication skills to engage effectively with a wide-ranging audience, both orally and in writing</td>
<td>Essential</td>
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<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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<td>Ability to develop research objectives, projects and proposals for own and joint research, with the Essential assistance of a mentor if desired</td>
<td>Essential</td>
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<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>
<th>Essential / Desirable</th>
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<tr>
<td>Experience of carrying out both independent and collaborative research</td>
<td>Essential</td>
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<td>Experience in writing high-quality technical documentation</td>
<td>Essential</td>
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<td>Ability to work as part of a team and also to work independently using your own initiative</td>
<td>Essential</td>
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<td>Ability to confidently present to a variety of audiences and defend project outcomes</td>
<td>Desirable</td>
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<td>Experience of writing up research work for publication</td>
<td>Desirable</td>
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<tr>
<th>Personal attributes</th>
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<tr>
<td>Attention to detail, while keeping high-level goals in focus, and commitment to high quality</td>
<td>Essential</td>
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<td>Collaborative ethos</td>
<td>Essential</td>
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<td>Interest in and enthusiasm for the subject matter of the project(s)</td>
<td>Essential</td>
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<td>Positive attitude to colleagues and students</td>
<td>Essential</td>
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<td>Willingness to proactively and communicate with colleagues in other work areas/institutions</td>
<td>Essential</td>
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<td>Ability to plan and prioritise your own work in order to meet deadlines, including using initiative to plan research and development programmes</td>
<td>Essential</td>
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<td>Willingness to proactively seek learning opportunities to expand knowledge and skills</td>
<td>Essential</td>
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THE DEPARTMENT

The Department of Electronic Engineering at York has a longstanding reputation for high-quality degrees and successful graduates. Our MEng and BEng courses in a number of subject areas (http://www.york.ac.uk/electronics/undergraduate/) are fully accredited by the IET (Institution of Engineering and technology) at CEng (Chartered Engineer) level and our BSc in Music Technology at IEng (Incorporated Engineer) level. The Department is consistently highly ranked for electronic engineering in the annual National Student Survey. Our suite of taught MSc programmes covers the latest technologies and tools in important industry sectors.

In REF 2013 87% of our research outputs, was judged world-leading or internationally excellent. Our research groups in physical layer electronics, engineering management, communications and signal processing, intelligent systems work with industry and universities across the world while providing a friendly and supportive environment for staff and students.

The Department has 40 academic staff (including part-time and job share), nearly over 400 undergraduate students and approximately 200 postgraduate students. There are 13 administrative staff (including part-time and job share) as well as the team of 14 technical staff who provide assistance in the teaching and research laboratories, departmental infrastructure and maintain the workshops supporting these activities.

The Department continues to hold the Bronze Award from Athena SWAN for promoting women in science, which was won in 2013. 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 of Electronic Engineering operates a family friendly policy and is committed to gender equality and diversity. The Department recognises that a flexible approach to working is vitally important in the recruitment and retention of staff who have family commitments. The Department offers flexible working hours to all staff and will actively support job sharing and career break requests where it is reasonable and practical to do so and where operational needs will not be adversely affected. 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.
THE DEPARTMENT

Further details of the Department can be found on its website: https://www.york.ac.uk/electronic-engineering/

Intelligent Systems and Nanoscience Research Group

Our research links engineering and technology with nature. We focus on electronic, computational and robotic platforms and their interactions with biological systems. We also undertake fundamental research into the next generation of nanoelectronic hardware.

We develop novel biologically-inspired electronic, computational and robotic systems. We work to characterise and understand biological and biomedical signals and exploit evolutionary mechanisms in system design and optimisation. This systems-level research is underpinned by our fundamental studies into the next generation of innovative nanoelectronic materials and devices, including bio-molecular electronic systems and spin-based electron devices.

In particular the KTP’s academic supervisor, Dr. Trefzer’s research interests include variability-aware analogue and digital hardware design, biologically motivated models of hardware design, evolutionary computation, and autonomous fault-tolerance. He is researching computational capabilities of CNTs, including direct evolution and reservoir computing models. His vision is to create novel architectures and autonomous systems, which are dynamically self-optimising and inherently fault-tolerant, by porting key enabling features and mechanisms from nature to hardware. He is co-investigator on 3 currently running EPSRC / DSTL projects: Platform Grant - Bio-inspired Adaptive architectures and Systems (EP/K040820/1), Graceful (EP/L000563/1) and Complex In-materio Computation for Robust Dynamical Control, as well as on the previous EPSRC project PAnDA (EP/I005838/1).

We use our technical developments in a variety of real-world applications, including:

- VLSI technology design and fabrication
- autonomous intelligent vehicles
- fault-tolerant systems
- control systems
- neural and immune systems
- diagnostic technology for healthcare
- modeling and analysis of medical data
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 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](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 7492
- Complete the online application form

You will need to submit your completed application by midnight (local UK time) on 30 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 rukmalabeysekera@york.ac.uk

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

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