

## Research Associate – Digital Pathology

Job Ref: REQ180859

**As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.**

### Project Description

#### Multi-centred validation of digital whole slide imaging for routine diagnosis

This is a large collaborative research project involving several hospital trusts (University Hospitals Coventry & Warwickshire NHS Trust, Nottingham University Hospitals NHS Trust, Belfast Health and Social Care Trust, John Radcliffe Hospital NHS Trust, and the United Lincolnshire Hospitals NHS Trust) and universities (University of Warwick, University of Nottingham, Loughborough University, University of Birmingham, The Queen's University of Belfast). The purpose of the project is to study factors pertinent to the introduction of digital pathology (DP) in the UK.

Digital pathology refers to the use of high throughput slide scanners to digitise diagnostic histopathology slides that are then reported on computer workstations as opposed to a light microscope (LM). This recent development allows electronic distribution of work to pathologists so that difficult cases can be shared between individuals in different locations so helping to reduce possible error and improve overall performance. However, prior to adoption, it is important to demonstrate that DP is fit for purpose by providing tissue imaging of sufficient quality to ensure diagnostic accuracy equivalent to light microscopy, which is the current standard of care.

In this project teams of pathologists (in Coventry, Oxford, Lincoln, Nottingham and Belfast) will all examine the same series of histopathology samples, from different pathology domains (namely; renal, breast, gastrointestinal and skin), on both LM and DP. As part of the project the pathologists' visual examination techniques using DP will be monitored using appropriate eye tracking equipment and the resultant data will be analysed alongside reporting discrepancies to examine the development of DP expertise and also identify if poor technique contributes to error in reporting. The work will develop both a practical and theoretical understanding of the nature of diagnostic errors using digital pathology. This research will build on related research, for instance in breast screening radiology, which has identified three sources of observer error (visual, perceptual and cognitive) that can then be targeted so as to improve performance.

The post will entail designing appropriate studies, travel to pathology laboratories to carry out eye tracking studies and do the recording and the data analyses. It will also involve gathering information (i.e. expert interviews; develop mock up system using some rapid prototyping software) to set up an assessment/training approach for DP.

Using prototyping software an assessment and training approach for digital pathology will be created and coded to industry software standards and trialled iteratively. Also, the project aims to set up a DP reader standard to test an artificial intelligence algorithm.

## Job Description

**Job Grade:** Specialist and Supporting Academic Grade 6

### Job Purpose

To develop, trial and implement techniques to monitor individual's performance in examining pathology slides and digital pathology images.

### Job Duties

- To examine how individual pathologists examine digital pathology images and how their microscope interaction behaviour corresponds to their image interpretation performance.
- To liaise with NHS personnel at trial sites to arrange visits for data collection and training.
- To help develop a model of ideal pathological reporting behaviour when interpreting digital pathology images.
- To carry out studies at various NHS Trust laboratories.
- To collect and analyse data from various studies and provide reports to the Project Lead.
- To assist in determining and evaluating the current pathology interpretation performance of the Trial pathologists using statistical analysis techniques.
- Develop and provide various training options for trial pathologists to enable them to achieve modelled ideal performance in conjunction with the Project Lead.
- To assist in the development of techniques to avoid pathologist fatigue whilst ensuring efficient interpretation procedures are followed.
- To assist with the development of an interactive self-assessment and training system which identifies shortfalls in an individual's pathological interpretation and targets these through dedicated training so as to improve their performance.
- To trial the pilot training system at the Trial NHS Trusts, collect data, analyse the data and provide reports to the Project Lead.
- To statistically assess, for the less expert pathologists, how performance increases over time during the project.
- To help determine the best way of interpreting DBT images in terms of both accuracy and minimal reading time.
- To provide information to the Project Lead for reports to the Funder.
- To attend project meetings as and when required.
- To work in a team environment with other co-workers to achieve targets within the specified deadlines.
- To collaborate with other team members to produce journal and conference papers arising from the research.
- To undertake training and present research findings at meetings and conferences as appropriate.
- To work with complete confidentiality and sensitivity to participants and their data.

#### *Related Activities*

- To participate in regular project meetings
- To comply with internal requirements for administrative procedures
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### Points to Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

## **Special Conditions**

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

## **Organisational Responsibility**

Line management and supervision will be the responsibility of Dr Yan Chen. Project Teams will regularly meet to set targets and evaluate progress.

## Person Specification

Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

- 1 – Application
- 2 – Test/Assessment Centre/Presentation
- 3 – Interview

### Essential Criteria

Area	Criteria	Stage	
Experience	Extensive experience of eye movement recording in applied settings, particularly healthcare	1,3	
	Good experience with databases	1,3	
	Very experienced with Excel	1,3	
	Experience of software development (e.g. Matlab, C, and C++)	1,3	
Skills and abilities	Database and data handling skills using SQL and Excel	1,3	
	Competence in advanced IT skills	1,3	
	Communication skills sufficient to be able to liaise with a variety of people and present research findings in a variety of formats such as presenting at meetings and conferences	1,3	
	Project management skills and the ability to meet deadlines	1,3	
	Good English verbal and written communication skills	1,3	
	Accuracy and attention to detail	1,3	
	Ability to deal with complex confidential data	1,3	
	Flexibility	1,3	
	Training	A willingness to undertake further training as appropriate and adopt new procedures as and when required	1,3
	Qualifications	Good first degree or equivalent in Computer Science	1
PhD in Information Science, Computer Science or HCI related subject		1	
Other	Willingness to travel to research locations within the UK to carry out experimental studies	3	
	Willingness to possibly travel abroad to carry out experimental work	3	
	Commitment to observing the University's Equal Opportunities policy at all times	3	

### Desirable Criteria

Area	Criteria	Stage
Experience	Familiarity with medical imaging, pathology or the NHS	1,3
	Experience with developing image processing software	1,3
	Several years research experience	1,3
	Writing project reports	1,3
	Human factors knowledge	1,3
Skills and abilities	Ability to help prepare research proposals	1,3

	Familiarity with image processing Techniques	1,3
Other	Aptitude and motivation to assume more senior duties.	1,3

## Conditions of Service

The position is full time and fixed term for 3 years. Salary will be on Grade 6, (£30,395 - £39,609) per annum, at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Grade 6 and above staff, details of which can be found [here](#).

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which are available at <http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure---page.html>.

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html>)

In addition, the University is supportive, wherever possible, of flexible working arrangements. We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>