



Candidate Information

Position:	Senior Research Fellow (Computer Image Analyst Lead)
School/Department:	School of Medicine, Dentistry and Biomedical Sciences
Reference:	24/111696
Closing Date:	Monday 25 March 2024
Salary:	£46,497 per annum
Anticipated Interview Date:	Friday 19 April 2024
Duration:	Available until 31 March 2025

JOB PURPOSE:

To lead and manage the computer image analysis section of the Precision Medicine Centre of Excellence (PMC). To develop, validate and maintain analytical tools, image and data analysis pipelines and algorithms to analyse digital images from cancer specimens, in the context of clinical studies and clinical trials.

To develop and coordinate the development of Artificial Intelligence tools for the analysis of tissue images (H&E, chromogenic IHC and multiplex Immunofluorescence) for the interpretation of tissue based evidence and the generation of new interpretative algorithms.

To oversee and supervise the analysis and interpretation of vast amounts of images (with the complexity stated above), linked with clinic-pathological meta-data and providing timely and accurate feedback. To correlate digital findings with clinical outcomes and integration with other datasets such as to develop new diagnostic, prognostic and predictive tools in image analysis.

The post-holder will perform data analysis in large cohorts of samples and will be required to provide statistical analysis as appropriate.

To contribute significantly in report, manuscript and grant preparation and writing. The successful candidate will be responsible for providing support for the generation and implementation of image and associated data analysis pipelines, data management strategies, as well as the generation of diagnostic imaging and imaging databases. They will be expected to integrate into a multidisciplinary environment provided on site, and to interact with key clinical and scientific stakeholders.

MAJOR DUTIES:

1. To lead the image analysis scientific development in the TH&DP section of the PMC.
2. To plan and lead image analysis data for the PMC, including evaluation and planning of incoming projects and advise on resources needed and timescales.
3. Generate novel analytical tools and develop innovative ways of interacting with project teams to maximise the use of complex datasets.
4. To lead and develop pipelines for the processing and analysis of raw images of different formats, creating interpretative algorithms for analysis of simple and complex image generation, using the state-of-the-art high performance computing facilities on site.
5. Update and maintain databases and the tools required for the analysis, storage and reporting of tissue images coupled with clinical data, as well as ensuring that the PMC complies with legal and professional requirements in regards to storage and transmission of patient's images and associated sensitive data.
6. To influence the capability and delivery of the Centre by designing and implementing new computation workflows for large cancer image analysis projects.
7. To supervise, providing support and direction to other image analysts in the section.

8. To integrate with digital pathology and genomic sections and work closely with their leads to deliver on the projects carried out by the Centre.
9. To work collaboratively with other computational biologists / bioinformaticians to enhance develop and enhance University wide activities in this area.
10. To identify and troubleshoot problems, working collaboratively with colleagues to overcome issues.
11. To develop new scientific hypothesis and lead in grant writing and grant reporting for the section.
12. Oversee the development and management of bespoke database framework with connections to pertinent public image databases.
13. To curate, warehouse and backup images and data as they are generated in a timely manner.
14. To provide analytical outputs in defined and acceptable formats from image analysis experiments that can be interrogated by research and clinical scientists as required.
15. To write complex computer image analyses for presentation and publication in a timely fashion.
16. To oversee and support end-users to ensure data is interrogated appropriately and meets all standards for peer-reviewed publications.
17. To oversee and maintain valid records of image analysis activities and organise corrective action as appropriate. To perform routine data checking/cleaning.
18. To assist supervising and providing support and mentorship to junior and technical members of staff, post graduate students and PhD students.
19. To routinely communicate complex and conceptual ideas to those with limited knowledge and understanding as well as to peers using high level skills and a range of media.
20. To prepare scientific manuscripts and presentations for peer review and publication. To present progress reports to the team and supervisor regularly as well as external audiences.

ESSENTIAL CRITERIA:

1. Have obtained a PhD in computational biology, bioinformatics, biostatistics, mathematics or related discipline.
2. Substantial relevant research or clinical experience in computer image analysis, leading to publications of significant impact.
3. Experience of working with Linux/UNIX environments.
4. Significant experience managing and analysing tissue images and other big data.
5. Proficiency with handling image file formats deriving from commercial scanners for pathology slide image generation.
6. Comprehensive experience in handling segmentation-based architectures, both convolutional- and transformer-based following image optimization techniques such as Adam.
7. Experience in assessing Deep Learning tool output performance with defined performance metrics and be able to justify said use.
8. Experience of handling statistical analyses such as ROC, Kaplan-Meier, Random Forrest analysis, multi- & univariate analysis methodologies.
9. Experience of direct managing of projects.
10. Significant experience using and managing and curating internal and external databases (clinical and images).
11. Significant experience in engaging with industry partners in the co-development of image analysis tools.
12. Significant experience in engaging with industry partners in materials to take image analysis products through regulatory agencies.
13. Proficiency with software such as QuPath, Python: PSF, PyTorch: BSD, Fastai: Apache, OpenCV: Apache License.
14. Proficiency with perl, python, bash and/or equivalent languages.
15. Significant experience creating, querying and maintaining databases, particularly MySQL or PostgreSQL.
16. Experience with suitable analysis and plotting languages, particularly R or Matlab.
17. Publication record in a relevant field commensurate to experience.
18. Knowledge of high performance computing systems and job scheduling.
19. Excellent verbal and written communicational skills.
20. Excellent organisational and inter-personal skills.
21. Excellent project management skills.
22. Ability to plan, organise & prioritise work and meet deadlines.
23. Excellent attention to detail.
24. Ability to communicate complex information clearly and efficiently.
25. Team worker, highly motivated, supportive of colleagues within the group.
26. Ability to show initiative and work independently when required.

27. Ability to work with clinical images, conforming to regulatory requirements.

DESIRABLE CRITERIA:

1. 1st Class or 2.1 undergraduate degree.
2. Understanding of cancer datasets.
3. Experience as invited speaker in national and international meetings.
4. Experience in translational cancer research.
5. Experience of working in cancer genetics.
6. Track record of publications in cancer including first authored publications in high-impact journals.
7. Experience contributing to applications for peer reviewed research funding from national or international granting bodies.
8. Outstanding IT skills.
9. Experience of delivering lectures/tutorials on computer science imaging analysis based approaches.