

Position Description

Image Analyst

Position Number: 00079928
Position Title: Image Analyst (Postdoctoral Fellow)
Date Written: October 2019

Faculty / Division: Engineering /Division of Research
School / Unit: Mineral and Energy Resources Engineering / Mark Wainwright Analytical Centre
Position Level: Level A/B

ORGANISATIONAL ENVIRONMENT

UNSW is currently implementing a ten-year strategy to 2025 and our ambition for the next decade is nothing less than to establish UNSW as Australia's global university. We aspire to this in the belief that a great university, which is a global leader in discovery, innovation, impact, education and thought leadership, can make an enormous difference to the lives of people in Australia and around the world.

Following extensive consultation in 2015, we identified three strategic priority areas. Firstly, a drive for academic excellence in research and education. Universities are often classified as 'research intensive' or 'teaching intensive'. UNSW is proud to be an exemplar of both. We are amongst a limited group of universities worldwide capable of delivering research excellence alongside the highest quality education on a large scale. Secondly, a passion for social engagement, which improves lives through advancing equality, diversity, open debate and economic progress. Thirdly, a commitment to achieving global impact through sharing our capability in research and education in the highest quality partnerships with institutions in both developed and emerging societies. We regard the interplay of academic excellence, social engagement and global impact as the hallmarks of a great forward-looking 21st century university.

To achieve this ambition, we are attracting the very best academic and professional staff to play leadership roles in our organisation.

UNSW BEHAVIOURS

UNSW recognises the role of employees in driving a high-performance culture. The behavioural expectations for UNSW are below.



Values in Action
Our UNSW Behaviours



Builds
Collaboration



Embraces
Diversity



Displays
Respect



Demonstrates
Excellence



Drives
Innovation

OVERVIEW OF RELEVANT AREA AND POSITION SUMMARY

The working space will be within the facilities at the Mark Wainwright Analytical Centre (MWAC) and the Tyree micro-CT laboratory. MWAC comprises 11 Facilities or Units with major research instrumentation located in purpose-built high-grade laboratories. The Centre houses important instrumentation for the study of structure and composition of biological, chemical and physical materials and also includes sample preparation laboratories, smaller instruments and computing facilities. In addition, it provides professional and technical support for the instruments and research projects.

The Tyree micro-CT laboratory established at UNSW in 2015 and sits within the School of Minerals and Energy Resources Engineering (MERE). In 2017, the facility became part of the Cross-Faculty/Infrastructure Project network laboratory facility in collaboration with the MWAC. The Tyree micro-CT laboratory currently hosts two HeliScan™ micro-CT scanners. One of the scanners is installed in a dedicated lead-lined room to allow complex experimental set-ups, such as high pressure and high temperature petrophysical/mechanical/fluid/chemical tests. The facility has a dedicated image analysis laboratory with several local high-performance computers and access to Raijin supercomputer in Canberra.

The particular divisions at MWAC that will be supported are the Biological Imaging Resources Laboratory (BRIL), the Solid State and Elemental Analysis Unit (SSEAU), and the Electron Microscope Unit (EMU). In addition, the Image Analyst will also work in close collaboration with the team at the Tyree micro-CT laboratory. The Tyree micro-CT facility is also supported by subscription model from the Schools of Mechanical and Manufacturing, Minerals and Energy Resources Engineering and Civil Engineering. The Image Analyst will preferentially (but not exclusively) perform analysis of imaging data produced in the multiple imaging modalities hosted within these different units at UNSW.

The Image Analyst is responsible for the implementation of algorithms and pipelines for diverse image processing tasks, including inter and intra-modal 3D image fusion, analysis of structural image features and the extraction of physiological and microstructural parameters, from micro-CT, PET and MRI datasets. In addition, co-registration of the multiple 2D/3D imaging techniques such as SEM, XRD, XRF, and fluorescence microscope into micro-CT data is also part of the scope.

The Image Analyst reports to the Prof. Klaus Regenauer-Lieb and has no direct reports.

RESPONSIBILITIES

Level A

- Contribute to the development and management of the image processing and archiving infrastructure and databases within MWAC and the Tyree micro-CT laboratory.
- Maintain software for image data evaluation and visualization.
- Assist MWAC and the Tyree micro-CT users with image processing and data evaluation to support research and work with research teams to find solutions to challenges in relation to their image data analysis.
- Collaborate with facility users to develop new image-processing algorithms and methods, and develop and implement image processing pipelines to support the needs of users.
- Collaborate with UNSW EPICENTRE in implementation of image visualization for broader audience, both nationally and internationally.
- Train and supervise users in the application of image post-processing software packages, pipelines and visualization tools, including in-house developed scripts and programs.

- Assist with the publication of research findings, support grant applications and attend relevant workshops and conferences as necessary.

Develop the implementation of GPU-based solvers to address complex matrix computation in an efficient manner using statistical parametric mapping (SPM) algorithms.

- Contribute to writing of related reports, proposals and other documents as required by MWAC, Tyree micro-CT laboratory, UNSW or external agencies.
- Contribute to MWAC, Tyree micro-CT lab and UNSW projects and initiatives as required.
- Cooperate with all health and safety policies and procedures of the university and take all reasonable care to ensure that your actions or omissions do not impact on the health and safety of yourself or others.

Level B (in addition to Level A)

- Work independently to provide expert specialist advice on image analysis to users of the facility at MWAC and Tyree micro-CT lab.
- Actively contribute to collaborative projects in areas of expertise with researchers using the MWAC facility and the Tyree micro-CT lab.
- Contribute to strategic planning for the continued development of MWAC and Tyree micro-CT lab.
- With MWAC and Tyree micro-CT colleagues, engage with the broader preclinical, clinical and minerals imaging community at the University, precinct, state and national level through participation in meetings, conferences and collaborative activities.

SELECTION CRITERIA

Level A

- Degree or PhD in / Computer Science / Imaging Science / Physics / Mathematics / Material Science or equivalent with a solid background in image analysis, and co-registration of multiple imaging systems.
- Demonstrated experience with image processing algorithms and their application in the medical and minerals studies.
- Demonstrated proactive initiative to acquire basic knowledge of operational principles of various imaging modalities including micro-CT, MRI, PET, XRF, XRD, SEM and fluorescence microscope.
- Demonstrated knowledge and experience in data post-processing applicable to structural and molecular/tracer imaging modalities in micro-CT, MRI, PET, XRF, XRD, SEM and fluorescence microscope.
- Experience in the implementation and use of advanced image processing software packages of interest to the MWAC and Tyree micro-CT laboratory users. This include both free software (such as TomoPy, Matplotlib, SPM) and commercial software (such as Avizo, Amira).
- Demonstrated programming skills in scientific applications and scripting languages including python, matlab, octave and/or java, C/C++, and the ability to support the management and operation of scientific IT infrastructure and databases.
- Capacity to work with, train and support others in image analysis methods within a multidisciplinary research environment.
- Ability to work effectively in an independent role and work collaboratively with others in a research environment with individuals from diverse backgrounds.

- Demonstrated ability to determine proactive innovative solutions to challenges and ability to multitask within an environment with competing priorities.
- Excellent written and oral communication skills, including the ability to liaise with a diverse group of individuals, interpret and present analytical results, and write scientific reports.
- Knowledge of health and safety responsibilities and commitment to attending relevant health and safety training.

Level B (in addition to Level A)

- High level consultation and communication skills, and an ability to develop and maintain effective working relationships with key individuals within and external to the immediate work unit.
- Demonstrated ability to assume responsibility for project planning and delivery with minimal supervision.
- High level analytical and problem-solving skills with a demonstrated ability to consider problems and make informed decisions to deliver research outcomes.
- A proven track record in research support and collaboration, delivering excellent outcomes while managing multiple projects and challenges.

It is not the intention of the position description to limit the scope or accountabilities of the position but to highlight the most important aspects of the position. The aspects mentioned above may be altered in accordance with the changing requirements of the role.