EMPLOYMENT TYPE: Fixed term contract
CLASSIFICATION: Level ARAS

DIVISION: Information Technology, Engineering and the Environment
UNIT: Division Office
LAST REVIEWED: January 2020

BROAD PURPOSE
The position will contribute to developing an approach to allow for the routine analyses of root distribution in soil cores using synchrotron-based X-ray tomography. The position will primarily utilise the IMBL beamline at the Australian Synchrotron to conduct research and analyses.

This position is one of several that are being funded as part of a collaboration between the Grains Research and Development Corporation (GRDC), the University of South Australia, the University of Queensland, Murdoch University, and the Australian Synchrotron (ANSTO). Overall, this large research program aims to develop synchrotron-based techniques as an approach for improving our understanding of plant-soil interactions in Australian grain-producing systems.

POSITION ENVIRONMENT
The University of South Australia (UniSA) is Australia’s University of Enterprise. Our culture of innovation is anchored around global and national links to academic, research and industry partners. Our graduates are the new urban professionals, global citizens at ease with the world and ready to create and respond to change. Our research is inventive and adventurous, and we create new knowledge that is central to global economic and social prosperity. Today, we are South Australia’s largest university and ranked amongst the very best young universities in the world.

The University has a wide range of expertise across four academic divisions, including: Business; Education, Arts and Social Sciences; Health Sciences; and Information Technology, Engineering and the Environment. We offer over 200 world-class degrees and are known for our experiential approach to teaching and learning, and outcomes-focused research. We are committed to educating individuals to the highest standards, investing in the very best academics and professional staff, as well as state-of-the-art physical and virtual infrastructure.

The Division of Information, Technology, Engineering and the Environment boasts high standards of academic excellence and is the only Australian university to have all its assessed Engineering research rated ‘well above’ world class in ERA 2018. The Division is modern and vibrant, embracing both fundamental and applied research. Our academic schools, flagship research institute and related research concentrations are at the cutting edge of research-informed teaching and knowledge transfer in four areas that are among the most significant to modern society:

- Sustainable Natural and Built Environments
- Information and Communication Technologies
- Advanced Manufacturing and Materials
- Resources, Minerals and Energy

The Division has a diverse and multicultural workplace environment with over 500 academic and professional staff and a total of approximately 6,000 students enrolled both onshore and offshore. Students studying onshore are located on all five campuses of the University - Mawson Lakes, Magill,
City East, City West and Whyalla. In addition, undergraduate and postgraduate programs are delivered offshore.

**REPORTING RELATIONSHIPS AND KEY STAKEHOLDERS**

This position reports directly to the Dean: Research and Innovation and will work closely with the Associate Professor in Soil and Environmental Sciences at the University of Queensland.

Key stakeholders that this position must liaise with includes:

**Internal**
- Future Industries Institute

**External**
- Funding body (GRDC) representatives, Australian Synchrotron (ANSTO) representatives, the University of Queensland representatives, Research Fellows involved in this GRDC project.

**CORE RESPONSIBILITIES**

1. Undertake innovative and high quality research under limited supervision using synchrotron-based X-ray tomography to examine root distribution in soils.
2. Work with a wide range of researchers from other groups from across Australia to co-ordinate the collection of large soil cores from the field for their analyses at the synchrotron.
3. Under guidance of Chief Investigator/s, conduct a series of experiments to determine the experimental conditions suitable for these analyses.
4. Develop a user-friendly data pipeline in conjunction with the computing group to allow routine data processing for determining root distribution within soil following analysis using X-ray tomography.
5. Make key contributions to develop procedures for the segmentation of processed data.
6. Maintain clear and accurate records of work performed.
7. Contribute to the preparation of reports to the University of South Australia, the University of Queensland, and the funding body (GRDC).
8. Prepare and contribute to high quality, peer-reviewed publications for international journals.
9. Undertake administrative duties associated with relevant research projects, as required from time to time.
10. Foster the University’s relations with industry, government departments, professional bodies and the wider community.

The responsibilities as specified above may be altered in accordance with the changing requirements of the position.

**SPECIAL REQUIREMENTS**

- Some out of hours work may be required.
- Some inter/intra state travel may be required.
- This position is based primarily at the Australian Synchrotron at Clayton (Melbourne).

**UNIVERSITY REQUIREMENTS**

Staff must follow and apply the following:

1. **Core Staff Attributes**
   - To contribute to a successful and enterprising culture at UniSA, each staff member is expected to demonstrate the following key behavioural attributes:
     - **Is trusted, authentic and self-aware** – establishes credibility, is honest, reliable, accountable, and responsive
     - **Takes the initiative and delivers results** – by seizing opportunities and being outcome and customer focussed
• **Provides solutions** – through logical, creative and innovative thinking and timely, transparent and consultative decision making
• **Communicates with impact** – displays clarity, diplomacy, persuasiveness and sensitivity
• **Leads and works well with others** - displays conviction and resilience, working collaboratively, motivating others and mobilising influence.

2. **Health Safety & Injury Management**
   • Follow reasonable instructions, work procedures and practices to maintain the health and safety of yourself and others.
   • Report all identified workplace hazards and incidents.

3. **Performance Development and Management**
   Participate in the University’s Performance Development and Management process.

**SELECTION CRITERIA**

**Essential**
1. PhD in the area of X-ray tomography or a closely related imaging approach.
2. Demonstrated expertise in the use of X-ray tomography specifically for imaging of roots within soil would be highly advantageous.
3. Experience in the development of pipelines for processing data from X-ray tomography, especially for the analyses of root distribution in soil.
4. Experience in tomography data segmentation.
5. Excellent written communication, verbal communication, and interpersonal skills, including the ability to work and communicate well in a multidisciplinary team.
6. A willingness to be involved in research in remote locations, and to travel regularly (both domestically and internationally) to conduct specific analyses.
7. Organisational and problem solving skills.
8. Experience in the production of scientific reports, journal publications, and standard operating procedures.
9. Commitment to upholding the University's values, and with the outstanding personal qualities of openness, respectfulness and integrity.

**Desirable**
1. Experience in soil science, plant science or environmental chemistry.