Charles Sturt University

Position Description

Postdoctoral Scientist

Graham Centre for Agricultural Innovation

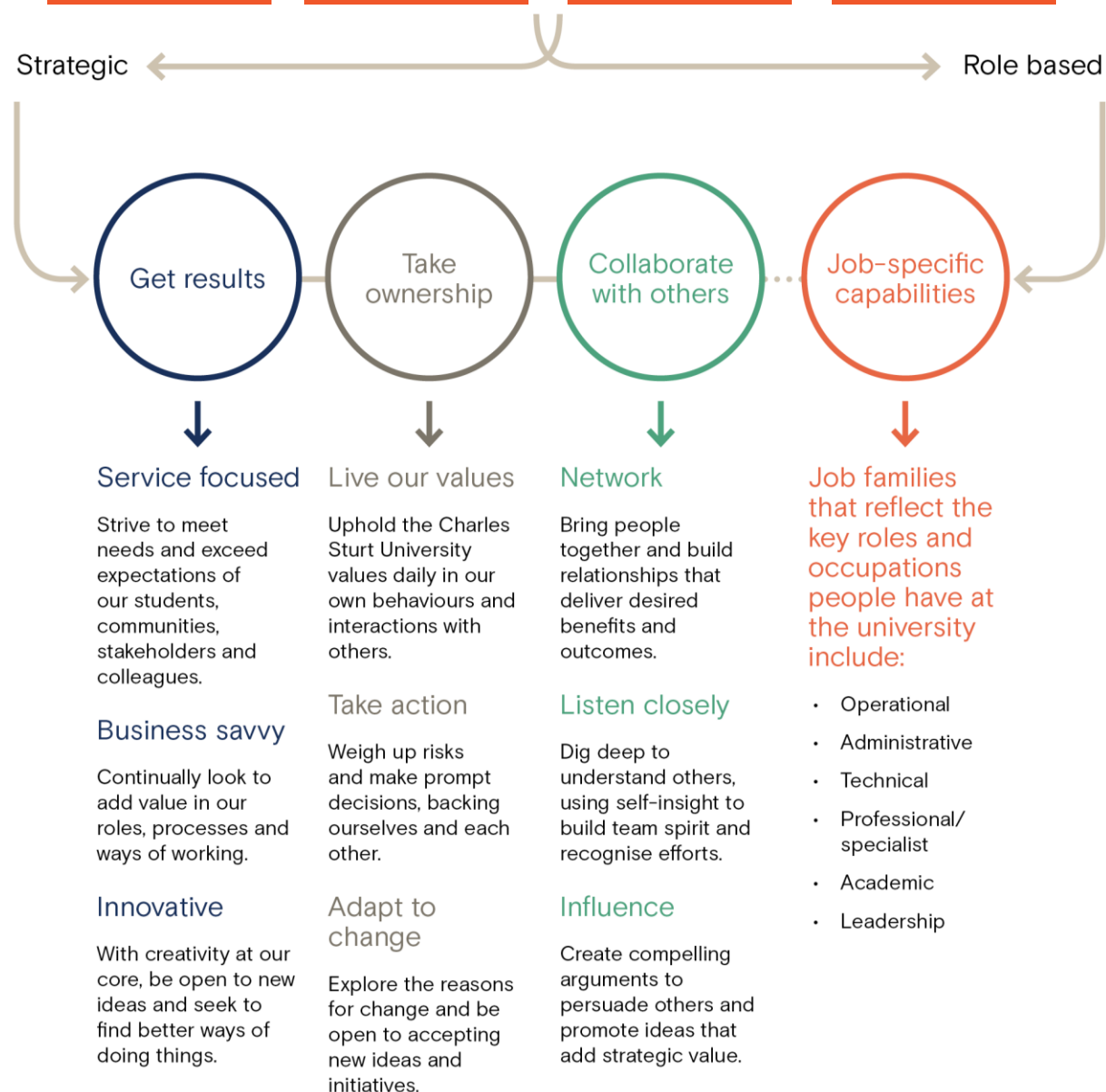|	
Classification	Academic Level A
Delegation Band	Delegations and Authorisations Policy (see Section 3)
Nature of Employment	Fixed term
Workplace Agreement	Charles Sturt University Enterprise Agreement
Date Last Reviewed	June 2020

Graham Centre for Agricultural Innovation

The Graham Centre for Agricultural Innovation is an alliance between Charles Sturt University (CSU) and the NSW Department of Primary Industries (NSW DPI), established in 2005 to strengthen the capacity of these organisations to undertake industry-relevant research and development.

The Centre is focussed on delivering solutions for crop and livestock systems, across value chains. The 2017-2021 Strategic Plan defines our focus and intent. It aligns with the strategic plans of both the NSW Department of Primary Industries and Charles Sturt University, as well as relevant industry strategic plans and the National Science and Research priority areas of Food and Soil and Water.
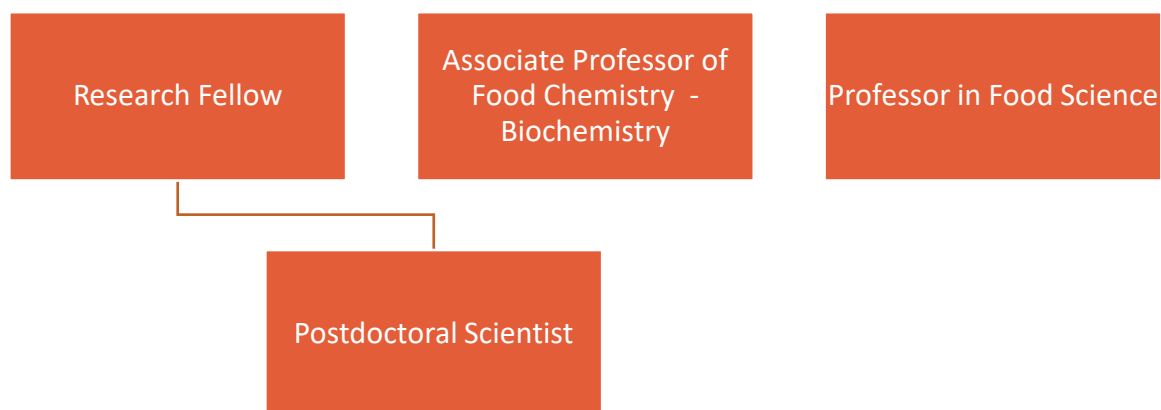
Our University Values

Impactful
Outcome driven

Inclusive
Stronger together

Insightful
Understanding people and the world

Inspiring
Leading for the future

Strategic ←――――――――――→ Role based

Get results

Service focused

Strive to meet needs and exceed expectations of our students, communities, stakeholders and colleagues.

Business savvy

Continually look to add value in our roles, processes and ways of working.

Innovative

With creativity at our core, be open to new ideas and seek to find better ways of doing things.

Take ownership

Live our values

Uphold the Charles Sturt University values daily in our own behaviours and interactions with others.

Take action

Weigh up risks and make prompt decisions, backing ourselves and each other.

Adapt to change

Explore the reasons for change and be open to accepting new ideas and initiatives.

Collaborate with others

Network

Bring people together and build relationships that deliver desired benefits and outcomes.

Listen closely

Dig deep to understand others, using self-insight to build team spirit and recognise efforts.

Influence

Create compelling arguments to persuade others and promote ideas that add strategic value.

Job-specific capabilities

Job families that reflect the key roles and occupations people have at the university include:

- Operational
- Administrative
- Technical
- Professional/ specialist
- Academic
- Leadership

Organisational Chart

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┌──────────────────────┐   ┌──────────────────────┐   ┌──────────────────────┐
│                      │   │  Associate Professor  │   │                      │
│    Research Fellow    │   │   of Food Chemistry   │   │ Professor in Food     │
│                      │   │     - Biochemistry    │   │ Science              │
└──────────┬───────────┘   └──────────────────────┘   └──────────────────────┘
           │
     ┌─────┴────────────┐
     │                  │
     │  Postdoctoral    │
     │  Scientist       │
     └──────────────────┘
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Reporting relationship

This position reports to: Research Fellow

This position supervises: N/A

Key working relationships

- Associate Professor of Food Chemistry - Biochemistry
- Professor in Food Science
- PhD Student

Position overview

This position will enhance the Australian rice industries capacity to compete in the global rice market place. This will be achieved through the application of sophisticated software to historical and current Australian rice industry data to better understand the key drivers of rice grain quality.

Principal responsibilities

- Be responsible for the development of a software system as a data analytics tool. The software system/tool will be called the Grain Quality Prediction Model Builder (GQPM Builder). The GQPM Builder will use data from the Rice Data Trust (RDT) and build useful Grain Quality Prediction Models (GQPMs) from the data.

- Use Charles Sturt University developed and generic algorithms in the GQPM Builder on the relevant data from the RDT to produce useful GQPMs.

- Develop the GQPM Builder that will access the data supplied from the RDT, apply the necessary algorithm/s and produce GQPMs to predict crop yield (t/ha), whole grain yield (WGY %) and, potentially, a broader set of grain quality attributes.

- Develop the GQPM Builder that will utilize data from the RDT to create and update rice variety-specific rice grain quality prediction models (GQPMs). The GQPMs will be generally more reliable as more data of high quality is captured and downloaded to and from the RDT. The GQPMs will provide the capacity to predict crop yield and WGY based on the crop growing variables of growing temperature, rainfall, irrigation regimes and applied nitrogen quantity and timing. The RDT will provide such data in a suitable format.

- Develop the GQPM Builder that will allow its users to get data from the RDT, choose various parameters and conditions for building data mining models, and then build useful data mining models such as ensemble of trees for knowledge discovery, making sense of data and future prediction.

- Develop GQPM Builder as a useful and user friendly software system that can be simultaneously accessed by various users.

- Debug the GQPM Builder to ensure its usefulness and cyber security.

- Be responsible for providing IT support to a PhD student on the development of useful models and prediction.

- A strong understanding of cutting-edge data science techniques as well as the skills to implement these in software. In particular, the candidate will need to understand the construction of decision forests and predictive modelling and feel comfortable with developing software for these tasks.

- A very strong background in Python and the NumPy stack. Additional skills in R, Java, Rust, C/C++ will be favourably considered.

- An understanding of web application development, with strong skills in JavaScript, PHP, RESTful API design and standards compliant HTML and CSS.

- Experience with relational DBMS is essential, in particular a knowledge of PostgreSQL and MySQL.

- Ability to develop useful and well-designed applications for both the command line and web interfaces, taking high-quality user experience into account throughout their development.

Physical capabilities

The incumbent may be required to perform the following.

- Work in other environments beyond the school, such as other campuses, as well as possible car and air travel and work with a diverse range of staff, students and community members.

- On occasion drive a university vehicle distances up to 500km per day within the terms of the university's Driver Safety Guidelines and Policy.

Selection criteria

Applicants are expected to address the selection criteria when applying for this position.

Essential

    A. PHD in Data Science or a related field such as Computer Science or Software Engineering.

    B. Strong communication and interpersonal skills

    C. Capacity in construction of decision forests and predictive modelling and development of software for these tasks

    D. Strong background in Python and the NumPy stack

    E. Experience with relational DBMS, in particular a knowledge of PostgreSQL and MySQL

    F. Strong skills in JavaScript, PHP, RESTful API design and standards compliant HTML and CSS

Desirable

    G. Additional skills in R, Java, Rust, C/C++

    H. Eye for the "big-picture" when developing software

NEW SOUTH WALES

BRISBANE
Study Centre

PARKES
Regional University
Study Centre

DUBBO

PORT MACQUARIE

ORANGE

BATHURST

GRIFFITH
Regional University
Study Centre

GOULBURN
NSW Police Academy

SYDNEY
Study Centre
Manly
Parramatta

WAGGA WAGGA

CANBERRA

ALBURY-WODONGA

WANGARATTA
Regional University Study Centre

VICTORIA

MELBOURNE
Study Centre