Charles Sturt University

Position Description

Research Fellow in Cyber-physical Systems

Artificial Intelligence and Cyber Futures Institute

Office of the Deputy Vice Chancellor, Research

Classification	Level B
Delegation band	Delegations and Authorisations Policy (see Section 3)
Special conditions	N/A
Workplace agreement	Charles Sturt University Enterprise Agreement
Date last reviewed	May 2023

About Charles Sturt University

Purpose

The Wiradjuri phrase *yindyamarra winhanganha* means the wisdom of respectfully knowing how to live well in a world worth living in. This phrase represents who we are at Charles Sturt University – our ethos. It comes from traditional Indigenous Australian knowledge, but it also speaks to the vision of the university – to develop and spread wisdom to make the world a better place.

Vision

Charles Sturt University is set to undergo a decade of great reform that will see the university characterised by these key elements:

- An uncompromising drive towards excellence in every aspect of its operations
- A far-reaching strategic re-positioning of teaching, learning, research, and innovation
- A cementing of our position as Australia's pre-eminent rural and regional university

The overarching aim is to consolidate our institution so that it is demonstrably more resilient and sustainable by the end of the decade.

Goals

To deliver on our purpose and vision, the university has three key goals:

1. Maintain the university's position in the top five Australian universities for graduate outcomes based on employment and salary
2. Embed a culture of excellence across all aspects of the university's operations
3. Exponential growth in research, development, and innovation income in our chosen areas, delivering high impact outcomes for regional Australia

Our values

Charles Sturt has a proud history and is fortunate to have an outstanding group of diverse, passionate, and engaged people working with us. Our values of insightful, inclusive, impactful, and inspiring guide our behaviours and ways of working to help us achieve our ethos of creating a world worth living in.

Performance measures

In addition to the principal responsibilities all staff are required to contribute to the success of the university strategy including meeting university's eight key performance indicators:

Our Students	• Commencing progress rate • Student experience
Our Research	• Research income • Research quality and impact
Our People	• Engagement • All injury frequency rate
Our Social Responsibility	• Underlying operating result • Community and partner sentiment

Office of the Deputy Vice-Chancellor, Research

The Office of the Deputy Vice-Chancellor, Research is responsible for leading Charles Sturt University's research agenda to enhance research impact, output and engagement. This includes research training, partnerships, innovation, and commercialisation. A key focus is the development and implementation of strategies in these areas that increase capability, quality and impact in accordance with the goals of the university. The portfolio also includes First Nations engagement, which is a key area of importance for Charles Sturt.

To deliver on the university goal of research excellence, the university is establishing three research institutes, all with a digital and regional focus:

1. Gulbali Institute
2. Rural Health Research Institute
3. Artificial Intelligence and Cyber Futures Institute

Artificial Intelligence and Cyber Futures Institute

Artificial Intelligence and Cyber Futures Institute (AICF) is a new research Institute at Charles Sturt University aiming to become a world class research centre of excellence in data science, artificial intelligence, and cyber security, to pursue the agenda of regional discovery, showing how AI developed ‘off the beaten track’ and ‘in the wild’ can better serve not only rural and regional communities, but society as a whole, creating a new comparative advantage for Australia internationally.

Current work in the area of data science and AI happens primarily in large cities, which makes the production of research outcomes particularly relevant for people, algorithms, and complex systems located in large metropolitan areas. Yet, according to the United Nations, 3.4 billion people live in rural areas. These people are currently unable to enjoy the benefits of data-driven research as technologies, which work in large cities, but are not always operational, effective, and, most importantly, relevant, for regional communities.

AICF will explore how regional and rural data, data-driven tools, practices developed based on these data and tools, as well as systems that combine human-machine interactions in non-urban environments can be developed, enhanced and popularised to benefit society as a whole. Such data, tools, practices, and systems, due to their inherently inclusive, diverse, and sustainable nature will suggest new pathways to: building trustworthy data-driven systems; embedding transparent reporting practices in all AI-related research; promoting inclusive interoperable AI design relevant not only to cities but also to rural areas; maintaining ethical integrity of AI-driven designs, which should not exploit rural populations for the benefit of urban systems; and encouraging respectful co-creation between regions and cities.

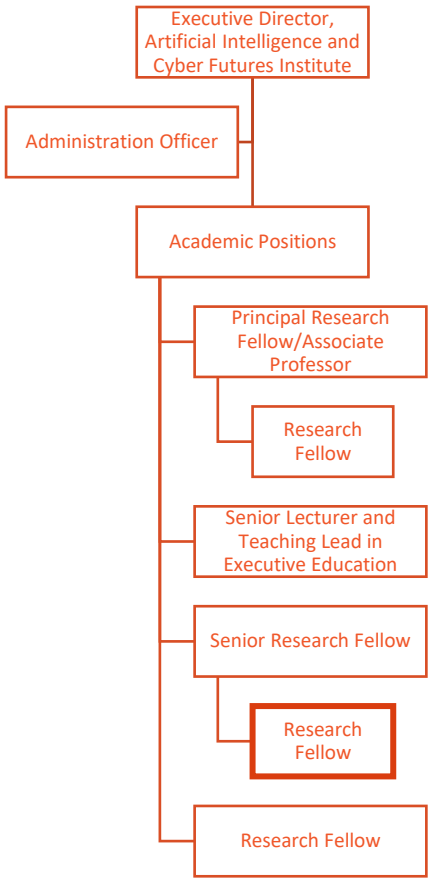
The AICF will seek to discover possible, feasible, and desirable regional futures, by advancing data science, artificial intelligence, and cyber security research to achieve a positive change in complex regional environments. The core principle of the AICF is research excellence, which implies having the best talent focused on challenging problems, working with dedication, integrity, sophistication, and responsibility.

The AICF objectives are to:

- **Advance** research in AI for Regional Futures: innovate and develop world-class research in data science, artificial intelligence, and cyber security with a regional AI flavour that supports next generation theoretical developments for society as a whole.
- **Translate** the research to address real-world problems: ensuring that the Institute’s research is co-created with practitioners and applied to real-world problems, generating the establishment of new businesses, services, and jobs.

- **Train** academic and industrial leaders of the future: train the next generation of data science, AI, and cyber security academics and practitioners with the necessary breadth and depth of technical and ethical skills to match the Australia's growing industrial and societal needs.
- **Position** Charles Sturt University as a leader in AI and cyber security research for regional discovery: develop and highlight the unique expertise of Charles Sturt University in regional and rural AI data, tools, practices, and systems; as well as support the University in achieving its strategic goals.
- **Lead** the public conversation in AI for Regional Futures: through agenda-setting research, public engagement, and expert technical advice, drive new and innovative ideas which have a significant influence on industry, government, regulation, or societal views, or which have an impact on how data science and artificial intelligence research is undertaken in Australia as well as internationally.

Organisational chart



Reporting relationship

This position reports to: Senior Research Fellow

This position supervises: PhD Student(s)

Key working relationships

- Deputy Vice-Chancellor, Research Portfolio
- Academics and Professional Staff within AI and Cyber Futures Institute
- Other Research Institutes, Centres, and Laboratories at Charles Sturt University
- Faculties and Schools at Charles Sturt University

Position overview

The Research Fellow will be responsible for leading activities across one or several academic directions of the AICF, including conducting world-class interdisciplinary scientific research, supervising PhD students and applying for external research funding. The appointee will be a strong research-focused scholar, who is interested in making a big impact in the field of AI with a focus on Regional Discovery and in contributing to and working within a supportive academic community.

The successful applicant will work closely with the Senior Research Fellow on *Robotics and Artificial Intelligence* projects. In particular, the candidate will be expected to develop new robust biomimetic learning algorithms (leveraging the benefits of AI) that can be applied to facilitate intelligent learning in multiple robotic platforms (e.g., quad robots, drones, etc.). As a spin-off of this project, the robust learning algorithms should also be extendable to address multiple challenging issues in non-linear modelling, control, and cyber-physical systems, namely, to accommodate large uncertainties while safeguarding the safe (legitimate) operation of the robots. The efficacy of the proposed learning algorithm will be investigated not only under extensive computer simulations, but also under real-time experiments.

Your work will be focussed in one of the following priority areas:

- Defence and cybersecurity
- Sustainable behaviours
- Smart supply chains
- Responsible AI

Principal responsibilities

- **Research and Innovation:** deliver high-quality research outputs in areas of interest by distributing impactful publications; delivering strategic initiatives; generating funding through grant applications, partnerships, and commercialisation; creating a culture of high-performance, international research excellence, and countability in areas of interest to AICF.
- **Cross-disciplinary focus:** assist the Institute in its goal to produce high-quality cross-disciplinary research fostering AI for Regional and Rural Development across its priority areas; conduct research that is multi-disciplinary and multi-site collaborative
- **Teaching and talent development:** deliver excellent research training and supervision; demonstrate leadership and excellence in teaching diverse student group, including executives.
- **Community/Partnerships:** ensure that the Institute participates and contributes to the well-being and improvement of the communities in which it operates; support and empower the development and implementation of the university's First National Engagement Strategy with respect to research through meaningful engagement, as well as contributing to high-quality research training and education; develop collaborative connections between the university's other research Institutes, Centres and Initiatives as well as with Industry partners, end-users and other stakeholders to strengthen and expand the research agenda; develop international research networks in the Institutes priority areas.
- **Corporate Social Responsibility, Ethics, and Integrity:** support AICF and Charles Sturt's commitment to corporate social responsibility; act with the highest level of professionalism and ethical behaviour and foster ethical and responsible decision-making amongst others; be compliant with the University's policies and procedures, and external regulations and codes.
- **Governance:** provide advice, information, and progress reports to the Executive Director to help the Institute fulfil and deliver its strategic obligations and responsibilities
- **Disclosure:** ensure appropriate and timely disclosures consistent with the University's requirements on declaration of interests

- **Strategic planning:** assist with the development of research strategy in at least one of the AICF priority areas.
- **Risk Management:** follow the Institutes risk management plan, conduct regular risk assessments for research projects, provide assurance that the appropriate systems are in place to identify and manage risks relevant to the institute and that such risks are acceptable to Charles Sturt University and are within the guidelines established by the Council.
- **Supervision:** help to ensure that AICF research staff are nurtured and supported in their duties and career development plans, recommend appointments in the Institutes priority areas, monitor performance of the supervised staff providing feedback and training as appropriate.
- **Performance:** develop annual KPIs and performance plan in accordance with the AICF strategic goals.
- **Other:** carry out other duties and responsibilities assigned by the Senior Research Fellow, annually review position goals and KPIs in conjunction with the Senior Research Fellow and Executive Director in accordance with directions provided by DVCR portfolio.

Role-specific capabilities

This section comprises capabilities from the Charles Sturt Capability Framework identified as essential or critical for success in this role.

Innovative	With creativity at our core, be open to new ideas and seek to find better ways.
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 (delivery of strategies, projects).
Adapt to change	Explore the reasons for change and be willing to accept new ideas and initiatives.
Apply expertise and technology	Apply, develop, and share specialist and detailed technical expertise, understanding other organisational disciplines.
Present and communicate information	Speak clearly and fluently, express opinions, make presentations, respond to an audience, show credibility.
Cope with pressure and setbacks	Cope with pressure, keep emotions under control, balance work and personal life, stay optimistic, handle criticism.

Physical capabilities

The incumbent may be required to perform the following.

- Work in other environments beyond your base campus, such as other campuses.
- On occasion drive a vehicle distance up to 500km per day within the terms of the university's Driver Safety Guidelines

Selection criteria

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

Essential

A. A doctoral qualification in the field of artificial intelligence, field robotics, control systems, cyber security, cyber-physical systems, data-driven modelling (system identification), or a related field.

B. Strong track record of publications in Q1 Journals commensurate with the length of the candidate's research career (publications in IEEE Trans. Journals will be an advantage).

C. Proven experience or strong potential in securing external research funding.

D. Strong programming skills in MATLAB, C++, and/or Python.

E. Experience in working as a part of a research team, including co-supervising PhD students.

F. Demonstrated high-level communication, interpersonal skills, including a demonstrated ability or strong potential to consult and negotiate with a diverse range of internal and external stakeholders.

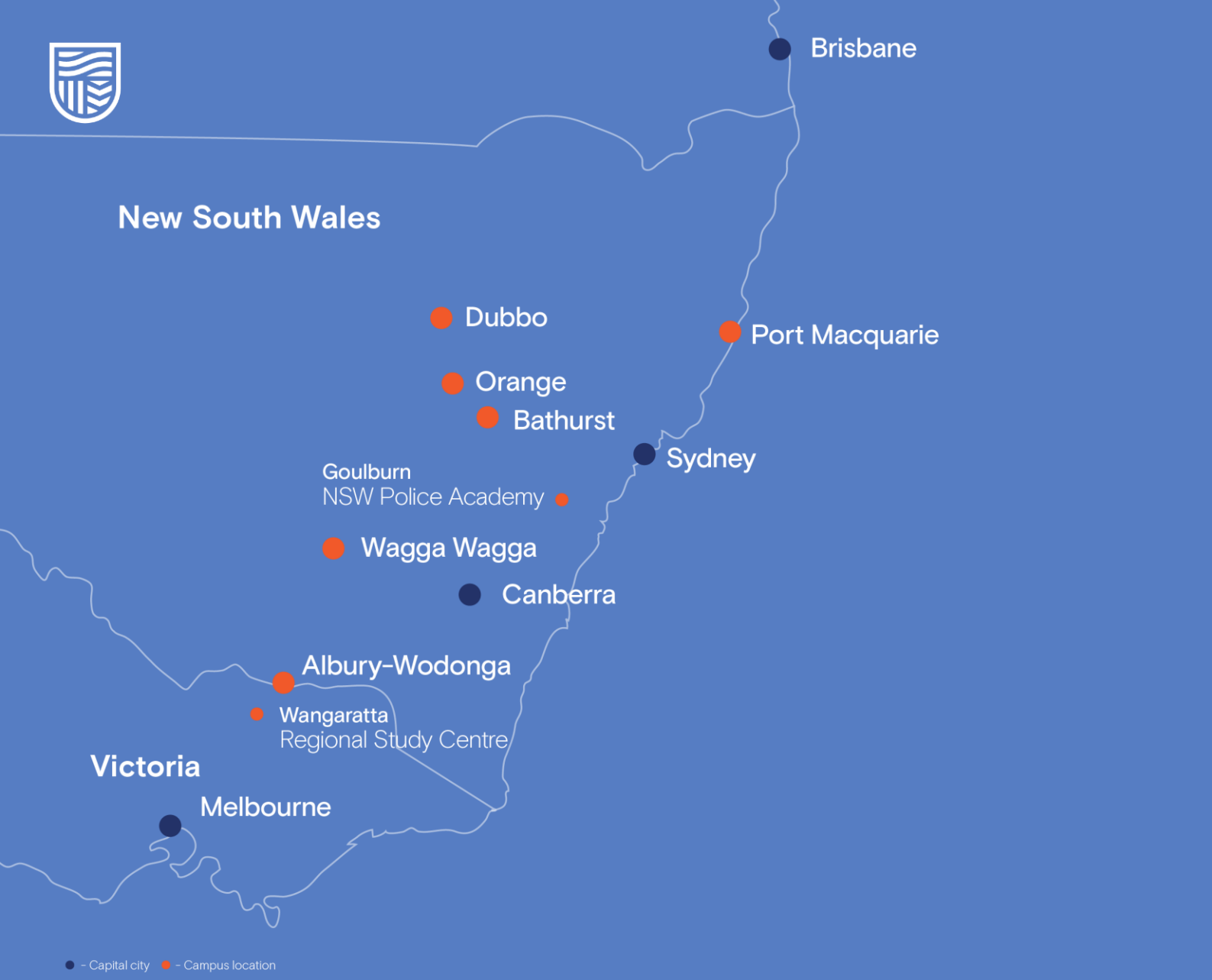
G. Demonstrated experience or ability to successfully complete or manage large and complex research projects.

H. Strong understanding of, and proven commitment to, research integrity and ethics to ensure compliance with relevant legislation and codes.

Desirable

I. Experience in ROS (Robot Operating Systems) middleware and Linux (Ubuntu) Operating Systems will be an advantage.

J. Previous experience working in regional or rural context is not essential but will be an advantage.


Brisbane
New South Wales
Dubbo
Port Macquarie
Orange
Bathurst
Sydney
Goulburn
NSW Police Academy
Wagga Wagga
Canberra
Albury-Wodonga
Wangaratta
Regional Study Centre
Victoria
Melbourne
- Capital city
- Campus location