College/Division:	ANU College of Science
Faculty/School/Centre:	Biological Data Science Institute
Department/Unit:	
Position Title:	Postdoctoral Fellow
Classification:	Level A
Position No:	
Responsible to:	Director, BDSI
Number of positions that report to this role:	
Delegation(s) Assigned:	D8

PURPOSE STATEMENT:

The Biological Data Science Institute (BDSI) is a multidisciplinary academic unit in the ANU College of Science that sits at the interface of data science and biological science. It aims to recruit, build and coordinate expertise in biological data science to accelerate the translation of biological data to biological knowledge. Operating in the space between traditional disciplines, the BDSI is positioned to collaborate widely to solve problems that have impact.

This position is being recruited in formal partnership with CSIRO to support their Future Science Platform in Machine Learning and Artificial Intelligence (MLAI FSP). The MLAI FSP is a new initiative building an exciting transdisciplinary research portfolio that leverages CSIRO's deep domain expertise and experience. To that end, FSP researchers will explore such questions as: (1) How do we use machine learning to augment a scientist's ability to generate and learn from scientific data?; (2) What is the best way to include domain constraints (such as physical laws) and design constraints (such as privacy and fairness) into machine learning models?; (3) Where can we exploit genomic information in plant and animal breeding?; and, (4) Why is deep learning so effective in extracting meaningful features? These are examples of a broader set of questions aiming to open new vistas of scientific knowledge and positive impact.

As a formal member of the FSP, the Postdoctoral Fellow will work with top scientists and engineers to develop and apply new machine learning and artificial intelligence methods with a specific emphasis on solving significant science questions. This role sits within the "Bioprediction" activity, and the Postdoctoral Fellow will be co-located with other researchers within the MLAI FSP. The Postdoctoral Fellow will work closely with leading analytical capability within CSIRO Data61 and CSIRO Agriculture and Food, as well as have the opportunity to interact with similar capability within BDSI, and in particular other members of this growing cross-institutional team. The successful candidate will work to develop, extend and leverage computational approaches to advance analytical frontiers to solve applied problems in the broad biological domain. This will be done as part of a diverse multidisciplinary team, which works across domains and scales.

POSITION DIMENSION AND RELATIONSHIPS:

The Postdoctoral Fellow will be embedded in a collaborative research team at the CSIRO Black Mountain site adjacent to the ANU Acton campus, while also being a member of the ANU Biological Data Science Institute. To facilitate seamless interaction, the Postdoctoral Fellow will be appointed to CSIRO via secondment and be accountable to their CSIRO MLAI FSP supervisor in that capacity. The Postdoctoral Fellow will be expected to work collegially across both organisations, leading by example to develop and maintain effective, productive and beneficial workplace relationships with all academic and professional staff, students and honorary appointees, as well as with industry stakeholders. This position will also have a mentoring role for students and will engage in collegial and productive collaborations with local, national and where possible, international colleagues.

Within the FSP, the Postdoctoral Fellow will be part of the activity "Object detection", and will focus on the development of new machine learning algorithms and research to tackle problems relevant to Agriculture, Aquaculture and Livestock industries. These problems require new solutions to: (1) bypass the limitations of hand-labelling data by incorporating domain knowledge or synthetic data; (2) integrate data from multiple streams with differing dimensionality (e.g. images, videos, 3D data, or non-imaging sensors); and, (3) capture signals in the temporal domain. In contributing to these solutions, the Postdoctoral Fellow will work at the interface between machine learning research and specific domain applications, and will interact with experts in both areas.

Role Statement:

In their role as an Academic Level A the Postdoctoral Fellow is expected to:

1. Undertake independent research of broad relevance to biological data science with a view to generating original and innovative results or methodologies. This may include publications in refereed journals, presentation of research at seminars and at national and international conferences, and collaboration with other researchers at a national level. This includes working as part of a team on an externally funded project subject to deadlines.
2. Collaborate with senior staff to actively seek and secure external funding, assist to prepare and submit research proposals to external funding bodies as appropriate.
3. Subject to the requirements of the funding source and where an opportunity exists, the occupant may be required to contribute to the teaching activities of the Institute. This includes, but is not limited to, the preparation and delivery of lectures and tutorials, the preparation of online material, marking and assessment, consultations, and with students or acting as subject coordinators.
4. Supervise students working on individual or group projects at undergraduate, honours, graduate-coursework levels. Assist with supervision of research students.
5. Assist to supervise research support staff in your research area.
6. Actively contribute to all aspects of the operation of the Institute.
7. Assist in outreach activities including to prospective students, research institutes, industry, government, the media and the general public.
8. Maintain high academic standards in all education, research and administration endeavours.
9. Proactively undertake development to grow effective researcher capabilities to support career goals.
10. Take responsibility for their own workplace health and safety and not willfully place at risk the health and safety of another person in the workplace.
11. A demonstrated understanding of equal opportunity principles and policies and a commitment to their application in a university context.
12. Other duties as required that are consistent with the classification of the position.

Skill Base

A Level A academic will work with the support and guidance from more senior academic staff and is expected to develop their expertise in teaching and research with an increasing degree of autonomy. A Level A academic will normally have completed four years of tertiary study or equivalent qualifications and experience and may be required to hold a relevant higher degree.

A Level A academic will normally contribute to teaching at the institution, at a level appropriate to the skills and experience of the staff member, engage in scholarly, research and/or professional activities appropriate to their profession or discipline, and undertake administration primarily relating to their activities at the institution. The contribution to teaching of Level A academics will be primarily at undergraduate and graduate diploma level.

SELECTION CRITERIA:

1. A PhD (or awarding of a PhD within six months of appointment commencement) in a field relevant to biological data science, including but not limited to computer vision, machine learning, artificial intelligence or computer science.
2. Depth of knowledge of computer vision and machine learning, and the ability to understand and develop mathematically-founded algorithms and their development in toolkits such as TensorFlow or PyTorch.8
3. Evidence of high level computational and programming skills (in Python or C++); experience in using them to build computer vision/machine learning models and conduct analyses.
4. Demonstrated high level written and oral communication skills with the ability to effectively represent the research team internally and externally, including publishing in peer reviewed journals and/or authorship of scientific papers, reports, and presenting at national and/or international conferences.
5. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations, preferably across diverse and inclusive teams.
6. Evidence of an ability and willingness to teach at all levels, as well as the ability to assist in the supervision of students working on research projects.
7. Demonstrated ability to work effectively as part of a multi-disciplinary, potentially regionally dispersed research team, as well as the ability, motivation and discipline to carry out independent research.
8. Demonstrated ability to communicate and interact effectively with wide range of stakeholders in a collaborative, cross-disciplinary research environment, and to foster professional, respectful and productive working relationships with staff, students and colleagues at all levels.
9. A demonstrated understanding of equal opportunity principles and policies and a commitment to their application in a university context.

Delegate Signature:		Date:	
Printed Name:		Position:	

References:
Academic Minimum Standards