# Position Details

## CSIRO Early Research Career (CERC) Postdoctoral Fellowship– CSOF4

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| **The following information is for applicants** |
| Advertised Job Title | CSIRO Postdoctoral Fellowship in Human-Machine Collaborative Processes for Biological Collection Science |
| Job Reference | 79985 |
| Tenure | Specified Term of 3 years Full-time |
| Salary Range | AU$89,926 to AU$98,504 pa + up to 15.4% superannuation |
| Location | Canberra, ACT |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | * Australian/New Zealand Citizens;
* Australian Permanent Residents; and
* Australian temporary residents currently residing in Australia (visa sponsorship may be provided to eligible onshore candidates)
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| Position reports to the | Project Leader |
| Client Focus – Internal | 80% |
| Client Focus – External | 20% |
| Number of Direct Reports | 0 |
| Enquire about this job | Pete Thrall (Peter.Thrall@csiro.au)Cecile Paris (Cecile.Paris@csiro.au)*Please do not email your application directly to Pete Thrall or Cecile Paris. Applications received via this method will not be considered.* |
| How to apply | Apply online at <https://jobs.csiro.au/> Internal applicants please apply via **Jobs Central**If you experience difficulties when applying, please email careers.online@csiro.au or call 1300 984 220. |

**Acknowledgement of Country**

CSIRO acknowledges the Traditional Owners of the land, sea and waters, of the area that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present. View our [vision towards reconciliation](https://www.csiro.au/en/about/Indigenous-engagement/Reconciliation-Action-Plan).

### Role Overview

**CSIRO Early Research Career (CERC) Postdoctoral Fellowships** provide opportunities to scientists and engineers who have completed their doctorate and have less than three years relevant postdoctoral work experience. These fellowships aim to develop the next generation of future leaders of the innovation system through:

* A differentiated career development program to deliver capability excellence and breadth across all facets of the national innovation system;
* Research training via strategic research and development projects with a clear focus that will deliver real impact through science and engineering excellence;
* An innovative culture supporting the development and demonstration of original thinking and expertise leading to peer-recognition; and
* Opportunities to develop skills and experience in collaborative research teams to effectively work within national and global multi/transdisciplinary and multi-stakeholder environments.

CERC Postdoctoral Fellows **are appointed for three years full-time or equivalent**.

This role will be embedded in CSIRO’s new Collaborative Intelligence (CINTEL) Future Science Platform (FSP). Future Science Platforms (FSPs) are an investment in science that underpins innovation and that has the potential to help reinvent and create new industries for Australia. There is growingacknowledgement that the best results ensue when humans work *collaboratively* with machines in both physical and virtual/digital worlds. The **Collaborative Intelligence (CINTEL) FSP** will develop the science that enables human intelligence and technology to work harmoniously together across multiple domains, exceeding the performance of either alone.

The **CINTEL** **FSP** is about exploring “collaborative intelligence” and developing the science required to achieve it, leading to greater adoption and effective use of technology, enhanced productivity, and safety. It will also explore how people and machines work and learn together, while ensuring meaningful and rewarding work for people, where machines augment rather than substitute human intellect. Achieving this will require **an interdisciplinary approach**, bringing together experts in social science, engineering and computer science, with domain expertise in the areas in which collaborative intelligence is to be deployed.

The Postdoctoral Fellow will be part of a cohort of early career researchers working with top CSIRO scientists and engineers to re-think how to partner human and machine intelligence in symbiotic relationships. The emphasis will be on research at the cutting edge of an emerging field to explore how to work with machines to boost human capabilities, enhance human decision making and performance, and build human trust in machines.

For this project, the Fellow will, in close collaboration with CSIRO scientists and curators in the National Research Collections Australia, take the lead in identifying, developing and deploying the first practical steps towards a broader concept of what a ‘digital curator’ could do and provide a ‘proof-of-concept’ demonstration of the value of integrating machine and human intelligence to assist with biological collection management.

It is beyond human capacity to effectively manage the volume of information that resides in biological collections, yet delivery of collection data, science and advice to external stakeholders depends on data accuracy. Dedicated machine intelligence could handle many tasks associated with data management and work interactively with humans when non-machine input is required or to monitor data capture activities in real-time. Ultimately, deployment of “digital team members” could improve efficiencies, data quality, and free up human curators to focus on higher value research-related work or core collection management. This will facilitate research in species delimitation, evolutionary biology, diagnostic and identification tools, and biodiversity discovery and ultimately aid in the understanding, conservation, and management of our unique biota.

### Duties and Key Result Areas:

Under the direction of senior research scientists and engineers, the successful candidate will:

* + Develop workflows and informatics pipelines combining automation and human decision making for practical use cases in biodiversity and collections science, e.g., integration, filtering, and quality control of large spatial and taxonomic datasets for analysis or digitisation of specimen data.
	+ Work closely with research scientists and curators to understand limitations of current work practices in collection management, specimen curation and biological research, and identify possible solutions combining data science and human expertise.
	+ Use relevant programming languages and methodologies such as Python, R, data mining, machine learning, optical character recognition, etc.
	+ Carry out evaluation of the developed software to demonstrate its competitiveness and fitness for purpose. Take responsibility for functionality, performance and robustness.
	+ Carry out innovative, impactful research of strategic importance to CSIRO, with the aim of achieving novel and wide-reaching scientific outcomes and ideas for further research.
	+ Collaborate with members of a diverse project team and external partners to ensure research directions can lead to lasting impact in application domains.
	+ Undertake regular reviews of the latest literature in data, biodiversity, and collections science.
	+ Publish results in relevant international scientific venues (high-level journals and conferences).
	+ Interpret and present research findings in data, biodiversity, and collections science to research scientists and practitioners from a wide range of other scientific areas.
	+ Recognise and exploit opportunities for innovation and the generation of new theoretical perspectives, and progress opportunities for the further development or creation of new lines of research.
	+ Utilise design thinking methodology to plan and prepare research proposals and apply non-academic impact methodology to research projects.
	+ Record, manage, and analyse data/information using relevant domain data science techniques.
	+ Proactively undertake development to grow effective researcher capabilities to support career goals.
	+ Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives and Making Safety Personal goals.
* Other duties as directed.

[**The CERC Postdoctoral Fellow learning and development program**](http://www.csiro.au/en/Careers/Student-and-graduate-programs/Postdoctoral-fellowships)is developed between the CERC Postdoctoral Fellow and their CSIRO supervisor. The program will focus on enhancing the Fellows’ capabilities to the level expected of an independent researcher and will include on-the-job and course-based development encompassing:

* Discipline-specific techniques and protocols
* Professional growth
* Project management
* Communication and influencing skills
* Working and collaborating with others

## **Required Competencies:**

* **Teamwork and Collaboration:** Cooperates with others to achieve organisational objectives and may share team resources in order to do this. Collaborates with other teams as well as industry colleagues.
* **Influence and Communication:** Uses knowledge of other party's priorities and adapts presentations or discussions to appeal to the interests and level of the audience. Anticipates and prepares for others reactions.
* **Resource Management/Leadership:** Allocates activities, directs tasks and manages resources to meet objectives. Provides coaching and on the job training, recognises and supports staff achievements and fosters open communication in the team.
* **Judgement and Problem Solving:** Investigates underlying issues of complex and ill-defined problems and develops appropriate response by adapting/creating and testing alternative solutions.
* **Independence:** Recognise and makes immediate changes to improve performance (faster, better, lower cost, more efficiently, better quality, improved client satisfaction).
* **Adaptability:**Copes with ambiguity or situations that lack clarity. Adapts readily to changing circumstances and new responsibilities (which may include activities outside own preferences) in the interests of achieving team objectives. Recognises the need for and undertakes personal development as a result of changes.

## **Selection Criteria**

#### Essential

*Under CSIRO policy only those who meet all essential criteria can be appointed.*

1. A doctorate (or will shortly satisfy the requirements of a PhD) in a relevant discipline area such as applied computer science, biodiversity science, behavioural science, or similar. **Please note:** To be eligible for this role you must have **no more than 3 years** (full-time equivalent) of postdoctoral research experience.
2. Experience or interest in one or more of the following: data science, biodiversity databases, collection science.
3. Demonstrated interest or experience in the study of human behaviour.
4. Strong computational and programming skills (e.g., in Python, R, C++, or similar) to build data processing and analysis workflows integrating database queries, machine learning, data mining, human decision making, and other aspects.
5. The ability to work effectively as part of a multi-disciplinary, potentially regionally dispersed research team, plus the motivation and discipline to carry out autonomous research.
6. High level written and oral communication skills with the ability to represent the research team effectively internally and externally, including the presentation of research outcomes at national and international conferences.
7. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
8. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable:**

1. Knowledge of (and demonstrated interest in) biodiversity data, e.g., collection specimens, geocoded occurrence data, nomenclatural and taxonomic databases.
2. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
3. Experience using high-performance computing clusters and source code versioning systems such as Git.

To be appointed as a CERC Fellow within CSIRO, candidates are required to have **submitted** their doctoral thesis at the time of commencement, as a minimum requirement, if PhD conferment has not been obtained. If a candidate has submitted, but their PhD has not yet been formally attained, the starting salary will be CSOF4-1 (AU$87,068). Upon CSIRO receiving written confirmation that the PhD has been awarded (within a six month period from commencement date), the salary will be increased to the negotiated level and the difference will be back-paid to the Officer’s start date.

Special Requirements

Appointment to this role may be subject to conditions including provision of a national police check as well as other security/medical/character clearance requirements.

* The successful candidate will be asked to obtain and provide evidence of a National Police Check or equivalent. Please note that people with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
* If the successful candidate is not an Australian Citizen or Permanent Resident, they may be required to undergo additional security clearances, which may include medical examinations and an international standardised test of English language proficiency (i.e. IELTS test) - https://ielts.com.au/

**Our value proposition**

We want CERC Postdoc Fellows to join our world class science, engineering and digital teams to solve big, complex problems that make a real difference to the future of Australia and the world.

You'll get to work with some of the most talented minds in their fields, not just in Australia, but in the world. At CSIRO, we spark off each other, learn from each other, trust each other and collaborate closely to achieve more than we could individually.

CSIRO Early Research Career (CERC) Postdoctoral Fellow Experience Employee Value Proposition (EVP). Find out more [here](https://www.csiro.au/en/careers/postdoctoral-fellowships)!

## **About CSIRO:**

We solve the greatest challenges through innovative science and technology. To find out more visit us [online](http://www.csiro.au/)!

Find out more about the National Research Collections Australia [here!](https://www.csiro.au/en/showcase/nrca)