# Position Details

*CSIRO Postdoctoral Fellowship in Multi-Level Evolutionary Robotics*

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

The following information is for applicants

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| Advertised Job Title**:** | CSIRO Postdoctoral Fellowship in Multi-Level Evolutionary Robotics |
| Job Reference: | 61505 |
| Relocation Assistance**:** | Will be provided to the successful candidate if required. |
| Applications Are Open To: | All Candidates |
| Percentage of Client Focus - Internal: | 100% |
| Percentage of Client Focus - External: | 0% |
| Reports to the: | Dynamic Platforms Leader |
| Number of Direct Reports: | 0 |
| How to Apply: | Please apply online at [jobs.csiro.au](https://jobs.csiro.au/) and enter the requisition number**.** Internal applicants please apply via ‘Jobs Central’ through the ‘People Hub’ icon  |
| Contact Details to Discuss this Position  | Dr David Howard via email: david.howard@data61.csiro.au |
| If You Have Difficulty Applying Please Contact: | Call 1300 984 220 or email csiro.online@csiro.au between 8.30 am and 5 pm Australian east coast time. |

## 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 or part time equivalent.**

The **CERC Postdoctoral Fellowship in Multi-Level Evolutionary Robotics** will undertake research at the intersection of evolutionary algorithms, robotics, and materials science. They will use state of the art algorithms to search for useful materials, deploy them into components, and subsequently create whole robots that are specialised to both their task and operating environment. This may involve the use of various computational design approaches (from evolutionary algorithms and machine learning to shape/size/topology optimisation), creating models and modifying simulators to capture interactions between the materials, components, and full robots.

The Fellow will be expected to get hands-on with our 3D printers for real-world generation and testing of the robots. The Fellow will also have the opportunity to engage with the AIM Future Science Platform, a cross-disciplinary research program combining materials science, machine learning, and robotics to generate innovative solutions for currently unsolved problems. This project provides opportunities to undertake placements at our international collaborators at INRIA, as well as domestically at Monash University.

The fellow will be guided by an international supervisory team with expertise in machine learning for materials discovery, diversity-based evolutionary algorithms, and evolutionary robotics.

## Duties and Key Result Areas:

* Under the direction of senior research scientists and engineers, CERC Postdoctoral Fellows:
	+ Develop multi-level algorithms by combining state of the art techniques across materials search, component search, and robot optimisation.
	+ Demonstrate the algorithm by physically creating task/environmentally-specialised robots.
	+ Carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes.
	+ Produce and present high-quality manuscripts for publication in top-ranked journals and client reports, presentation at international conferences, and supporting patent applications.
	+ Recognise and exploit opportunities for innovation and the generation of new theoretical paradigms, and progress opportunities for the further development or creation of new lines of research.
	+ Participate in effective functioning of the research team and help deliver CSIRO’s organisational objectives and plans.
	+ Proactively undertake development to grow effective researcher capabilities to support career goals
	+ Communicate effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancing CSIRO’s reputation.
* Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment plans and policies, Diversity initiatives and Zero Harm goals
* Other duties as directed.

**The CERC Postdoctoral Fellow learning and development program**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

<http://www.csiro.au/en/Careers/Student-and-graduate-programs/Postdoctoral-fellowships>

## Competencies:

1. **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.**
2. **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.**
3. **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.**
4. **Judgement and Problem Solving:** Investigates underlying issues of complex and ill-defined problems and develops appropriate response by adapting/creating and testing alternative solutions.
5. **Independence: Plans, sets and works to meet challenging standards and goals for self and/or others. Recognises where endeavours will make the most impact or difference, decides on desired outcome and sets realistic goals to reach this target.**
6. **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:

*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 Computer Science, Evolutionary Computing, Robotics, Mechatronic Engineering, Computational Chemistry, or Materials Science

***Please note:*** *To be eligible for this role you must have* ***no more than 3 years (or part time equivalent)*** *of postdoctoral research experience.*

1. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations
2. **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**
3. **A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.**

## Desirable Criteria:

1. Background in machine learning, optimisation, relevant modelling software and robotics simulators
2. Fluency in C++/Python.
3. Experience with 3D printing and CAD, e.g., Solidworks.
4. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
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.**

To be appointed as a CERC Postdoctoral Fellow within CSIRO, candidates are required to have **submitted** their PhD 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 $83,687. 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.

**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! <https://www.csiro.au/en/careers/postdoctoral-fellowships>

## About CSIRO:

At CSIRO we solve the greatest challenges through innovative science and technology. See more [online](http://www.csiro.au/)!

Find out more about [Data61](http://www.data61.csiro.au/)