# Position Details

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

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| The following information is for applicants | |
| Advertised Job Title | Postdoctoral Fellowship – Machine Learning for Robotics |
| Job Reference | 65482 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$86,434 to AU$94,679 pa + up to 15.4% superannuation |
| Location(s) | Brisbane QLD preferred. Other locations may be considered. |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | * Australian/New Zealand Citizens and Australian Permanent Residents * Australian temporary residents currently residing in Australia (visa sponsorship may be provided to eligible candidates) |
| Position reports to the | Project Lead |
| Client Focus – Internal | 70% |
| Client Focus – External | 30% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Peyman Moghadam via email at [peyman.moghadam@data61.csiro.au](mailto:peyman.moghadam@data61.csiro.au) or phone +61 7 3327 4601 |
| 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](mailto:careers.online@csiro.au) or call 1300 984 220. |

### 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 role of the Postdoctoral Fellowship in Machine Learning for Robotics is to carry out new cutting-edge research in area of Robotics, and deep learning techniques for Robotics application. The postdoctoral fellow will focus on developing novel deep learning frameworks that are explicitly designed for 3D LiDAR and LiDAR-camera robot’s data. The developed frameworks will be tested and deployed on real-world robotics platform. They will present the findings in appropriate top-tier journals or conferences.

### The CSIRO Robotics and Autonomous Systems Group, located in Brisbane, is part of the Cyber Physical Systems Research Program (CPS) at Data61, and is one of the leading applied robotics and autonomous systems research labs in the world. It has over 45 researchers and engineers, as well as many research interns, graduate students and visiting scientists. The Robotics Group has extensive laboratory facilities and research infrastructure and has a broad spectrum of collaborations with other CSIRO research units, as well as many universities and research centres in Australia and abroad.

### Duties and Key Result Areas:

Under the direction of senior research scientists and engineers, CERC Postdoctoral Fellows:

* Work with CSIRO scientists and engineers within the Robotics Research Group and across other research programs at Data61 to develop algorithms and techniques for deep learning frameworks for 3D LiDAR and LiDAR-camera robot’s data.
* Develop, implement and test novel machine learning and deep learning techniques on 2D/3D Multimodal, spatiotemporal sensory data.
* Implement these methods efficiently using programming tools such as TensorFlow and PyTorch on high performance and robot computing systems.
* Publish results in relevant international scientific venues (high-level journals and conferences).
* Implement the methodologies developed on robotic platforms and evaluate them through extensive indoor and outdoor field trials.
* Contribute to the effective functioning of the research team and help deliver CSIRO’s organisational objectives and plans.
* Communicate effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
* Collaborate with members of a diverse project team and external partners to ensure research directions can lead to lasting impact in application domains.
* Communicate effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
* 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: robotics, machine learning, artificial intelligence; electrical engineering; computer science or engineering; or applied mathematics or applied physics.

**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. Solid knowledge of machine learning, artificial intelligence and statistics, and the ability to understand and develop mathematically-founded machine learning algorithms and their development in toolkits such as TensorFlow or PyTorch.
2. Strong demonstrated theoretical and applied experience in two or more of the following key research areas: Deep Learning, robotics, Probabilistic framework, machine learning and Information theory.
3. Strong programming experience (C++ and/or Python)
4. Demonstrated experience in the collection and processing of large data sets, development of efficient algorithms on large datasets, and development of machine learning algorithms or protocols for processing noisy and unstructured data.
5. The ability to work effectively as part of a research team, plus the motivation and discipline to carry out autonomous research.
6. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
7. 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.

## **Desirable:**

1. Experience or interest in one or more of the following: deep neural networks including graph neural networks; Bayesian learning, cross-modal deep learning methods; weakly/self/semi-supervised learning.
2. Previous experience or research in 3D multimodal machine learning for mobile robots.
3. Familiarity with software development processes.
4. Experience with deep learning libraries (TensorFlow, PyTorch, Theano, etc).
5. Experience with CUDA or OpenCL programming.
6. Good experience using high-performance computing clusters and source code versioning systems such as Git
7. Experience in field trials of developed systems.
8. Experience with Robot Operating System (ROS)

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 AU$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.

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/)!

CSIRO is a values-based organisation.  In your application and at interview you will need to demonstrate behaviours aligned to our values of:

* 1. People First
  2. Further Together
  3. Making it Real
  4. Trusted

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