# Position Details

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

|  |
| --- |
| 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$83,687 to AU$94,679 pa (pro-rata for part-time) + up to 15.4% superannuation |
| Location(s) | Pullenvale QLD |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All 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 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 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, 3D LiDAR SLAM and deep learning techniques for Robotics perception. The postdoctoral fellow will focus on developing novel Bayesian deep learning frameworks that are explicitly designed for 3D LiDAR and multi-modal 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 Bayesian deep learning frameworks for multi/hyperspectral data.
* Develop, implement and test novel machine learning, statistical analysis and deep learning techniques on 2D/3D Multimodal, multi/hyperspectral sensory data.
* Contribute to collecting data in the field, annotating and cleaning data.
* Deploy developed technologies in new domains, and in demonstrating these technologies in the field.
* Implement the methodologies developed on robotic platforms and evaluate them through extensive indoor and outdoor field trials.
* Produce high quality scientific and/or engineering papers suitable for publication in quality journals, for client reports and granting of patents.
* Prepare appropriate conference papers and present those at conferences as agreed with your supervisor.
* Contribute to the effective functioning of the research team and help deliver CSIRO’s organisational objectives and plans.
* Work collaboratively with colleagues within your team, the business unit and across CSIRO.
* 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 Values, Health, Safety and Environment plans and policies, Diversity initiatives and Zero Harm goals.
* Undertake an appropriate training and development program developed by CSIRO.
* 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, mechatronics, electrical or mechanical engineering; computer science or engineering; 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. Strong demonstrated theoretical and applied experience in two or more of the following key research areas: Deep Learning, hyperspectral or Multispectral Image Processing, Probabilistic and statistical framework, machine learning and Information theory.
2. Strong programming experience (C++ and/or Python)
3. 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.
4. The ability to work effectively as part of a research team, plus the motivation and discipline to carry out autonomous research.
5. A record of science innovation and creativity plus the ability and willingness to incorporate novel ideas and approaches into scientific investigations.
6. A record of publication in top peer reviewed journals and conferences (i.e. high impact factor, or selective acceptance rate).

## **Desirable:**

1. Previous experience or research in computer vision and multi/hyperspectral image processing.
2. Previous experience or research in Bayesian deep learning frameworks.
3. Previous experience or research in 3D multimodal perception for mobile robots.
4. Familiarity with software development processes.
5. Experience with deep learning libraries (Caffe, TensorFlow, Torch, Theano, etc).
6. Experience with CUDA or OpenCL programming.
7. Experience with data storage systems.
8. Experience in field trials of developed systems.
9. 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/)!

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