# Position Details

## Research Scientist/Engineer- CSOF6

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| The following information is for applicants | |
| Advertised Job Title | Senior Research Scientist - Machine Learning for Robotics |
| Job Reference | 61795 |
| Tenure | Specified Term until end of August 2022  Full-time |
| Salary Range | AU$113,338 to AU$132,811 pa + 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 | Team Leader – Perception |
| Client Focus – Internal | 50% |
| Client Focus – External | 50% |
| Number of Direct Reports | 0 |
| Enquire about this job | **Dr Paulo Borges**  Email: [Paulo.Borges@csiro.au](mailto:Paulo.Borges@csiro.au) |
| 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

The role of Senior Research Scientist Staff in CSIRO is to conduct and lead innovative research leading to scientific achievements that are aligned with CSIRO's strategies. You may be engaged in scientific activity ranging from fundamental research to the investigation of specific industry or community problems. You will be responsible for developing solutions for research and external clients, having the opportunity to build and maintain networks, play a lead role in securing project funds, provide scientific leadership and pursue new ideas and approaches that create new concepts.

The Robotics and Autonomous Systems Group at CSIRO develops systems for perceiving the environment, for use in mapping, navigation and interpretation. The role of Machine Learning Robotics researchers and engineers is to help build on the existing expertise and develop new algorithms for new devices in order to enhance the perceptive ability of autonomous systems and mobile robots.

## This role will build and maintain solid research code, play a lead role in securing project funds, provide scientific leadership and pursue new ideas and approaches that create new concepts. As a Senior Research Scientist, you will work Machine Learning applied to Simultaneous Location and Mapping (SLAM), Path Planning, Scene Understanding and general robotics tasks. This role requires a high level of competence in mathematics, particularly 3D geometry, linear algebra, optimisers and mechanics, as well as excellent programming skills. Also, extensive exposure and expertise in modern machine learning algorithms is essential.

### Duties and Key Result Areas:

* Incorporate novel approaches to scientific investigations by adapting and/or developing original concepts and ideas for new, existing and further research.
* Understand and develop on the state of the art in Machine Learning in the context of Robotics Perception.
* Work with the deployment of mobile robots in the field.
* Communicate effectively and respectfully in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
* Produce high quality scientific and/or engineering papers suitable for publication in quality journals and for presentation at national and international conferences.
* Work effectively as part of a multi-disciplinary, often regionally dispersed research team, to undertake independent scientific investigations and carry out associated tasks under the guidance of more senior Research Scientists/Engineers.
* Work collaboratively and honestly with internal and external colleagues, clients and partners to help define and satisfy objectives for small to medium research projects.
* Assist in leading small research projects, including the negotiation of resource requirements.
* Provide coaching and on-the-job training to technical staff and students to ensure experiments are established in accordance with research design.
* Adhere to the spirit and practice of CSIRO’s Values, Health, Safety and Environment plans and policies, Diversity initiatives and Zero Harm goals.
* Other duties as directed.

## **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:** Identifies critical stakeholders and influences them via an influential third party, for example through an established network, to gain support for sometimes contentious proposals/ideas.
* **Resource Management/Leadership:** Sets up and maintains effective and efficient work teams and manages performance and resources, to achieve objectives. Chooses appropriate management strategies and communication styles to maintain high levels of motivation and productivity. Gives feedback for development purposes and provides support and direction for improvement.
* **Judgement and Problem Solving:** Anticipates and manages problems in ambiguous situations. Develops and selects an appropriate course of action and provides for contingencies. Evaluates, interprets and integrates complex bodies of information and draws logical conclusions, synthesises proposals and defends options with reasoned arguments.
* **Independence:** Assesses the risk and opportunity of identified strategies, options and actions. Overcomes problems and setbacks in achieving goals. Invariably includes consideration of value-added future impact on bottom line when determining the optimal and efficient use of resources.
* **Adaptability:**Demonstrates flexibility in thinking and adapts to, and manages, the increasing rate of organisational change by adjusting strategies, goal and priorities.

## **Selection Criteria**

#### Essential

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

1. A doctorate or equivalent research experience in a relevant discipline area, such as such as Electrical, Electronic, Mechanical or Control Engineering, Robotics Engineering, Computer Science.
2. Extensive experience with the development and innovation of machine learning algorithms, including experience with deep learning.
3. High level of expertise in applied mathematics, such as linear algebra, optimisation, and 3D geometry.
4. Extensive experience in scientific programming using C++.
5. Demonstrated knowledge and development experience with robotic learning algorithms, and their interaction with perception, planning and control in robotics.
6. The ability to work with mobile field robotics in outdoor environments.
7. Show experience with systems integration, having worked “hands-on” with mobile robotic platforms beyond simulation environments.

## **Desirable:**

1. Knowledge of Python, ROS and Matlab.
2. Experience with field deployments outside of laboratory or controlled environments.

Special 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.

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