# backgroundData 61 and CSIRO logoPostdoctoral Fellow – CSOF4

Role summary for potential applicants

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| Advertised Job Title**:** | Postdoctoral Fellow - Robotics |
| Reference Number**:** | 9463 |
| Classification**:** | CSOF4 |
| Salary Range: | AU $81k to AU $88k plus up to 15.4% superannuation |
| Location**:** | Melbourne, Victoria |
| Tenure: | Specified term of 3 years |
| Relocation assistance**:** | Will be provided to the successful candidate if required. |
| Applications are open to: | [x]  Australian Citizens Only  |
| Functional Area**:** | Research Scientist/Engineer – Postdoctoral Fellow |
| % Client Focus - Internal: | 90% |
| % Client Focus - External: | 10% |
| Number of direct reports: | 0 |
| Reports to the: | Robotic Systems Team Leader and DST Group Co-supervisor |

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| **Role Overview:** |
| **Postdoctoral Fellowships** at CSIRO provide opportunities to scientists and engineers, who have completed their doctorate and have less than three years relevant postdoctoral work experience. These fellowships will help launch their careers, provide experience that will enhance their career prospects, and facilitate the recruitment and development of potential leaders for CSIRO. Postdoctoral Fellows are appointed for up to three years and will work closely with a leading Research Scientist or Engineer in their respective field. They carry out innovative, impactful research of strategic importance to CSIRO with the possibility of novel and important scientific outcomes. They present the findings in appropriate publications and at conferences.The Robotics Group in the Connection to the Physical World Research Program of Data61 is seeking a talented and dedicated postdoctoral fellow with particular expertise in the area of Power, Energy and Autonomy for mobile robots. In particular, the candidate will be expected to work closely with the Defence Science and Technology Group (DSTG) to investigate and apply novel algorithms which allow mobile robots to operate for extended durations without manual refuelling or charging of batteries. This will include algorithms for autonomous navigation, management of on-board power use to maximise longevity, multi-criteria mission planning to minimise energy use and maximise energy harvesting potential. The candidate will conduct research on a mobile ground robot fitted with a variety of alternative energy sources such as a Hydrogen Fuel Cell, photovoltaic cells, Lithium Sulphur batteries etc.  |

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| **Duties and Key Result Areas:** |
| * Under the direction of senior research scientists, carry out innovative, impactful research of strategic importance to both CSIRO and DSTG that will, where possible, lead to novel and important scientific outcomes.
* Develop algorithms and techniques to increase the duration for which a mobile robot can operate without human intervention
* Integrate the latest forms of power generation, energy storage, energy harvesting and autonomy on a mobile robot to optimize energy generation and usage
* Facilitate liaison between DSTG and CSIRO to benefit Australian Defence capability.
* Undertake regular reviews of relevant literature and patents.
* 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 development of innovative concepts and ideas for further research.
* Make a contribution to the effective functioning of the research team and help deliver CSIRO’s organisational objectives and plans.
* Work effectively and collaboratively with DSTG colleagues.
* Work collaboratively with colleagues within your team, the business unit and across CSIRO, and within the DSTG team.
* 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.

***CSIRO’s postdoctoral training program***is developed between the Postdoctoral Fellow and a CSIRO scientist. 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>
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| **Selection Criteria:** |
| *Under CSIRO policy only those who meet all essential criteria can be appointed***Education/Qualifications:** * **Education/Qualifications:** A doctorate (or will shortly satisfy the requirements of a PhD) in a relevant discipline area, such as Robotics, Computer Science, Electrical or Mechanical Engineering, or similar.

***Please note:*** *To be eligible for this role you must have* ***no more than 3 years*** *of prior relevant postdoctoral experience.** **Australian Citizenship - Required for** Negative Vetting level 1 security clearance.

***Essential Criteria:***1. Demonstrated research experience with mobile ground robots, including multi-criteria mission planning, navigation and control.
2. Demonstrated experience in working with actual robotic systems (which may include physical construction, testing, hardware/software integration, etc.)
3. Programming experience (C++ or Python)
4. **The ability to work effectively as part of a multi-disciplinary, regionally dispersed research team, plus the motivation and discipline to carry out autonomous research.**
5. A record of science innovation and creativity, plus the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

**Desirable Criteria:**1. Experience with ROS (Robot Operating System)
2. Experience with robot navigation sensors (lidar, IMU, GPS)
3. Experience with alternative power sources for mobile robots (Hydrogen fuel cells, photovoltaic cells, advanced batteries etc.)
4. Experience with energy optimisation algorithms.

***To be appointable to this position you must also demonstrate the following capabilities:**** **Communication: High level written and oral communication skills with the ability to represent the research team effectively internally and externally, including at national and international conferences.**
* **Publications: A record of publications in quality, peer reviewed journals.**
* **Behaviours:** A history of professional and respectful behaviours and attitudes in a collaborative environment.

**CSIRO is a values based organisation. You will need to demonstrate behaviours aligned to our values of:*** Integrity of Excellent Science
* Trust & Respect
* Creative Spirit
* Delivering on Commitments
* Health, Safety & Sustainability

To be appointed as a 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 ($92,591). 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. |

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| **Other Information:** |
| **How to Apply**Please apply for this position online at [www.csiro.au/careers](http://www.csiro.au/careers). You will need to upload one document containing your cover letter and resume/CV. Please provide sufficient relevant information to enable the selection panel to assess your suitability. Should your application proceeds to the next stage, you may be asked to provide additional information.If you experience difficulties applying online call 1300 984 220 and someone will be able to assist you. Outside business hours please email: csiro-careers@csiro.au. **Referees**: If you do not already have the names and contact details of two previous supervisors or academic/ professional referees included in your resume/CV please add these before uploading your CV.**Contact:** If after reading the selection documentation you require further information please contact:Dr Stefan Hrabarvia email: Stefan.Hrabar@csiro.au.Please do not email your application directly to Dr Hrabar. Applications received via this method will not be considered.**About CSIRO:** Australia is founding its future on science and innovation. Its national science agency, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) is a powerhouse of ideas, technologies and skills for building prosperity, growth, health and sustainability. It serves governments, industries, business and communities across the nation. Find out more! [www.csiro.au](http://www.csiro.au). **About the Business Unit: Data61** is Australia’s digital powerhouse, formed by the recent integration of NICTA and CSIRO’s Digital Productivity business unit. We bring a multidisciplinary approach with design thinking, creativity, and behavioral economics to solve complex business problems, digital transformation and early stage commercialisation of data-centric solutions. Data61 is a CSIRO entity, Australia’s preeminent scientific organisation. Being part of CSIRO gives us access to deep domain expertise across all of the industry sectors most likely to be disrupted over next 5-20 years.Data61 focuses on every aspect of data research and development, from data capture [via sensor technology and robotics] to data consumption; communications and networking; infrastructure; hardware and software; cybersecurity; data statistics, modeling and analytics; decision sciences; behavioural economics and cognitive sciences—across every major industry sector.**Find our more at** [www.data61.csiro.au](http://www.data61.csiro.au)**About the Autonomous Systems Laboratory:** The Autonomous Systems Laboratory (ASL) is part of Data61 and is one of the leading autonomous systems labs in the world. It develops foundational and applied research in robotic and autonomous systems for a broad range of domains, including environmental research and monitoring, agile manufacturing, marine and atmospheric research, culture heritage and online learning, agriculture, mining, biodiversity and biosecurity, science platforms, and others. These systems provide scientific, social and economic benefits through deeper understanding of natural and built environments, increased productivity and human safety, and augmentation of human capabilities. **About the Defence Science Technology Group:** The Defence Science and Technology Group is part of Australia's Department of Defence. It is the second largest public-funded R&D organisation in Australia.See <http://www.dsto.defence.gov.au/> for further details. |