# Position Description

## Research Scientist in Field Robotics

## Research Scientist/Engineer – CSOF5

The following information is for applicants

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| Advertised Job Title**:** | Research Scientist in Field Robotics |
| Job Reference: | 59649 |
| Relocation Assistance**:** | Will be provided to the successful candidate if required. |
| Applications Are Open To: | Australian Citizens Only  Australian/New Zealand Citizens and Australian Permanent Residents Only   * All Candidates |
| Percentage of Client Focus - Internal: | 70% |
| Percentage of Client Focus - External: | 30% |
| Reports to the: | Team Leader, Data61 |
| Number of Direct Reports: | 0 |
| Name and Contact Details For Applicant Enquiries | Dr. Navinda Kottege – email: [Navinda.kottege@csiro.au](mailto:Navinda.kottege@csiro.au) |
| Contact Details For Applying | Call 1300 984 220 or email [careers.online@csiro.au](mailto:careers.online@csiro.au). |
| 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 |

## Role Overview:

The role of Research Scientist Staff in CSIRO is to conduct 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 have 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 has a track record for developing and deploying autonomous systems in the field. We are seeking to appoint a highly motivated Research Scientist to undertake navigation, planning and control research for field robots. The successful candidate will contribute to multiple projects undertaken by the CSIRO and in collaboration with other external partners. These projects will include the development and deployment of novel algorithms and tools for navigation, planning and control for wheeled, tracked and legged robot systems operating in difficult GPS denied areas such as subterranean and industrial environments with confined spaces. One such project is the current DARPA Subterranean Challenge in which the CSIRO Robotics and Autonomous Systems Group is competing in. The successful candidate will be joining a team of world-class researchers and engineers solving real-world problems and delivering impactful solutions based at CSIRO’s Queensland Centre for Advanced Technologies (QCAT) with extensive research, development and testing facilities.

To be successful in this role you will be enthusiastic about making hands-on contributions to solving research challenges common to multiple projects involving navigation, planning and control for autonomous robots. Under limited direction, the Research Scientist/Engineer will assist in the planning and preparation of research proposals and carry out research investigations, requiring originality, creativity and innovation.

CSIRO staff are professional scientists with no teaching duty. We strive on innovation and work closely with all the Universities, supervising and hosting many graduate and post-graduate students. CSIRO offers unique opportunity to mesh within the Australian innovation ecosystem and staff are exposed to deep technology start-ups and innovative commercial companies. We encourage and support entrepreneurship. This is a great opportunity for the successful candidate to work with other innovative researchers in a leading government organisation which is engaged in world class scientific research projects, and offers excellent career development and professional support. CSIRO is strongly committed to Diversity and offers Flexible Working Arrangements. The successful candidate will have a unique opportunity to translate their research into practice with impact on both Australian and international programmes.

## Duties and Key Result Areas:

* Carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes
* Develop and maintain planning and control algorithms for field robotics
* Work in the field with autonomous large and medium scale robots
* Incorporate novel approaches to scientific investigations by adapting and/or developing original concepts and ideas for new, existing and further research
* Draw on professional expertise, knowledge of other disciplines and research experience, recognise opportunities for innovation and generate new theoretical perspectives by pursuing new ideas/approaches and networking with scientific colleagues across a range of disciplines
* Communicate openly, effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation
* Work collaboratively as part of a multi-disciplinary, often regionally dispersed research team, and business unit to carry out tasks in support of CSIRO’s scientific objectives
* 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.

## 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.

## Essential Criteria:

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

1. A doctorate (or will shortly satisfy the requirements of a PhD) in a relevant discipline, such as Electrical, Electronic, Mechanical or Control Engineering, Robotics Engineering or Computer Science
2. **High level of expertise in applied mathematics, such as linear algebra, optimisation, control and planning theory**
3. **A minimum of two years’ experience in scientific programming using C++**
4. **Demonstrated knowledge of navigation, planning and control algorithms used in mobile field robotics**
5. **Extensive experience working with navigation, planning and control algorithms for mobile field robotics in outdoor environments, beyond simulation environments**
6. **Background with systems integration, having worked “hands-on” with mobile robotic platforms beyond simulation environments**
7. Knowledge and experience working with the Robot Operating System (ROS)
8. **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**
9. **A record of science innovation and creativity, plus the ability & willingness to incorporate novel ideas and approaches into scientific investigations.**

## Desirable Criteria:

1. Evidence of advanced scientific programming skills and software design in languages relevant for robotics research (e.g. C++, Python, MATLAB).
2. Experience with field deployments outside of laboratory or controlled environments.
3. **High level of expertise in applied mathematics, such as linear algebra, optimisation, control and planning theory**

## About CSIRO:

We imagine. We collaborate. We innovate. To find out more visit us [online](http://www.csiro.au/)!

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