# Position Description

## Research Scientist/Engineer – CSOF5

The following information is for applicants

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| Advertised Job Title**:** | Senior Proof Engineer |
| Job Reference: | 59422 |
| Relocation Assistance**:** | Will be provided to the successful candidate if required. |
| Applications Are Open To: | All Candidates |
| Percentage of Client Focus - Internal: | 20% |
| Percentage of Client Focus - External: | 80% |
| Reports to the: | Proof Engineering Team Leader |
| Number of Direct Reports: | 0 |
| Name and Contact Details For Applicant Enquiries  | Dr. Rafal Kolanski Email: Rafal.Kolanski@data61.csiro.au  |
| Contact Details For Applying | Call 1300 984 220 or email 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 Trustworthy Systems group at Data61 is a world-leading group in the field of formally verified software, and the creators of seL4, the world's first fully formally verified operating system kernel combining extreme performance and strong security & correctness proofs.

As a Proof Engineer at the Trustworthy Systems group at Data61, you will be involved in the development and maintenance of formal models, proofs and their automation, as well as other infrastructure for developing both verified software itself and new methodologies facilitating production of verified software faster, at greater scale, and in more depth.

In the role of Senior Proof Engineer, you will be expected to operate with a large degree of autonomy in obtaining outcomes in engineering projects, including supervision of other engineers and taking ownership of project planning and delivery.

## Duties and Key Result Areas:

* Develop, maintain, and improve formal models and proofs using theorem proving technology such as Isabelle/HOL and HOL4.
* Design and implement new approaches to formal modelling and proof, seeking opportunities to improve the way we construct robust, clear, and re-usable formal models, theorems, and other artefacts.
* Collaborate with systems engineers to effectively target formal models to specific systems and hardware.
* Collaborate with researchers to adapt methods/equipment/software/concepts/ideas in support of existing and further research.
* Lead small projects and assist with elements of larger projects including the ongoing planning of staff and resource requirements.
* Train and supervise staff as part of project planning and execution.
* 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.
* 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.

## Selection Criteria:

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

1. Relevant Masters/Bachelor’s degree or relevant work experience in Computer Science, Mathematics, or similar.
2. Programming experience, ideally in functional languages such as ML/Haskell.
3. Excellent written and oral communication skills, including the ability to anticipate the interests and knowledge level of an audience and present information and feedback accordingly.
4. An interest in good engineering practice (version control, automated builds, etc.).
5. Demonstrated ability to solve complex problems with a high degree of autonomy.
6. Ability to understand current research in computer science.
7. Experience with mentoring or training other engineers.
8. The ability to work effectively as part of a multi-disciplinary, regionally dispersed research team, and carry out tasks autonomously in support of scientific research.
9. Demonstrated ability & willingness to contribute novel ideas and approaches in support of scientific investigations.

## Desirable Criteria:

1. Experience in formal modelling and proof, preferably with interactive theorem proving tools such as Isabelle/HOL and HOL4.
2. Experience with systems programming, e.g., C, assembly, operating system implementation.
3. High level of mathematical maturity.

## Special Requirements:

Appointment to this role may be subject to conditions including security/national police/medical/character clearance requirements. Applicants who are not Australian Citizens or Permanent Residents 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/>

## About CSIRO:

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

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