# Position Details

## Research Projects- CSOF4/5

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| The following information is for applicants | |
| Advertised Job Title | Software Engineer – Computer Vision |
| Job Reference | 85724 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | CSOF4: AU$87,068k - AU$98,504k per annum (pro-rata for part-time), plus up to 15.4% superannuation  CSOF5: AU$102,724k – AU$111,165k per annum (pro-rata for part-time), plus up to 15.4% superannuation  \*NB: This position is offered across two levels, the appointment level will be determined by the qualifications, skills and relevant experience of the successful candidate |
| Location(s) | Pullenvale, Brisbane, QLD |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | * Australian/New Zealand Citizens and Australian Permanent Residents |
| Position reports to the | Team Leader |
| Client Focus – Internal | 20% |
| Client Focus – External | 80% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Jane Hodgkinson via email Jane.Hodgkinson@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. |

**Acknowledgement of Country**

CSIRO acknowledges the Traditional Owners of the land, sea and waters, of the areas that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present. View our [vision towards reconciliation](https://www.csiro.au/en/about/Indigenous-engagement/Reconciliation-Action-Plan).

### Role Overview

The role of Research Projects staff in CSIRO is to collaborate collaborates in scientific and technological activities with other research staff usually by assisting with detailed planning, undertaking or assisting with experimental, observational or technology development work, and in carrying out the more practical aspects of the work.

The CSIRO Mining Geoscience Team develops technologies for mining, manufacturing, space and other industries to improve safety and productivity. The team has a proven track record and is a leading provider of software and hardware to mining professionals such as geologists, geotechnical and blast engineers and surveyors. We pioneered the use of photogrammetric systems for rock mass characterisation and slope stability assessment, geophysical logging and microseismic monitoring for the Australian mining industry. We have also developed sensing technologies that are now being utilised or trialled in the medical, aeronautical and space industries. Our success has led to long term and ongoing commercial partnerships with leading technology providers. The work is underpinned by many years of experience with both 2D and 3D imaging systems, geophysical sensing and imaging technologies. We have successfully patented and commercialised innovative sensor and analytics systems.

The team is part of the Sustainable Mining Technologies Programme in CSIRO Mineral Resources. Based in Brisbane, the programme consists of over 60 researchers and engineers specialising in the automation, processing, numerical modelling, sensing and other domains for applications in the mining industry and beyond.

We are seeking an enthusiastic and talented software engineer to design and build the next generation of fused sensor systems for mining and aerospace industries. The projects will design and implement software to support sensor fusion for 3D scanning in space and safety monitoring in mining and civil engineering environments.

This position is offered across two levels. The appointment level will be determined by the qualifications, skills and relevant experience of the successful candidate.

### Duties and Key Result Areas

* Design and implement computer vision-based algorithms for mining, manufacturing, space and other applications.
* Comply with the company’s SDLC, project plans and industry standards.
* Deliver production level code with supporting unit tests.
* Contribute to collecting data in the lab or field, annotating and cleaning data.
* Deploying developed technologies, and in demonstrating these technologies in the field.
* Experimenting with new technologies and communicating the results.
* Respond courteously and efficiently to client requests, maintaining clear communication regarding mutual expectations and monitoring client satisfaction.
* Under technical direction, select the appropriate methods to perform standard analyses and be able to undertake technical tasks associated with trials, tests, measurement, reviews and investigations including associated calculations and analysis.
* Oversee the activities of less experienced staff and provide on-the-job training, as required.
* Design equipment and adapt techniques to meet special circumstances and client needs or undertake modifications to methods or equipment requiring limited innovation.
* Provide instruction on, and assistance to staff with activities pertaining to the immediate work area and responsibilities, as required.
* Look for opportunities to develop original experimental methods/equipment/software/concepts/ ideas in support of existing and further research.
* 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 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.

## **Selection Criteria**

#### Essential

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

1. Bachelor or higher degree in a scientific, mathematics or engineering discipline with significant component of formal training in software engineering, or equivalent commercial experience in software engineering*.*
2. Demonstrated expertise in designing, developing and implementing software supporting computer vision or other 3D sensing methods
3. Deep knowledge of SOLID principles and design patterns
4. Strong understanding of computing and mathematical concepts
5. High proficiency in software design using C++ in a cross-platform environment (min 2+ years programming experience)
6. Ability to communicate in a fluent and courteous manner, both orally and in writing, offering factual information supported by proven data, and providing appropriate feedback when required.
7. A history of professional and respectful behaviours and attitudes in a collaborative environment. Ability to work both autonomously and under guidance from researchers and working to deadlines
8. The ability to effectively manage a number of competing priorities simultaneously, and carry out non-routine tasks under general direction.
9. Proven ability to investigate routine problems by identifying and considering the implications of a range of available alternative solutions**.**
10. The ability to work effectively as part of a multi-disciplinary, regionally dispersed research team, and carry out tasks under general direction from Scientific Researchers
11. The ability and willingness to contribute novel ideas and approaches in support of scientific investigations

## **Desirable**

***We love code examples. If you have anything that we can look at, such as open source (e.g. on Github or BitBucket), we would appreciate if you mentioned it in your application.***

1. Experience with OpenCV and Point Cloud Library (PCL)
2. Experience with CUDA or OpenCL programming
3. Experience in developing in C#
4. Frontend Development (eg. Angular)
5. Matlab and Matlab Image Processing and Computer Vision Toolboxes
6. Experience working with, and writing software to interoperate with camera systems or other hardware
7. Demonstrated experience in producing decoupled and testable software (including version control, issue tracking, test automation)
8. Experience with field-testing of IT systems, including user studies, field experiments, analysis of field trial data, and debugging.

## **Required Competencies**

**CSOF4**

* **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.

**CSOF5**

* **Teamwork and Collaboration:** Cooperates with others to achieve organisational objectives and may share team resources in order to do this. Collaborates with other team 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:** 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:** Investigates underlying issues of complex and ill-defined problems and develops appropriate response by adapting/creating and testing alternative solutions.
* **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.
* **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.

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 Clearance or equivalent. Please note that individuals with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.

## **About CSIRO**

We solve the greatest challenges through innovative science and technology. Visit [CSIRO Online](http://www.csiro.au/) and [Mineral Resources](https://www.csiro.au/en/Research/MRF) for more information.

CSIRO is a values-based organisation.  In your application and at interview you will need to demonstrate behaviours aligned to our values of:

* People First
* Further Together
* Making it Real
* Trusted