# Position Details

## Research Scientist/Engineer- CSOF5

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| The following information is for applicants | |
| Advertised Job Title | Research Scientist in crop breeding optimisation |
| Job Reference | 99966 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$ $114k - AU$ 123k per annum (pro-rata for part-time) plus 15.4% superannuation |
| Location(s) | Black Mountain, Canberra, ACT |
| 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- Prediction and Selection |
| Client Focus – Internal | 20% |
| Client Focus – External | 80% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Shannon Dillon via email at [Shannon.Dillon@csiro.au](mailto:Warren.Conaty@csiro.au) or phone +61 2 6246 4834 |
| 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).

**Child Safety**

CSIRO is committed to the safety and wellbeing of all children and young people involved in our activities and programs. View our [Child Safe Policy](https://www.csiro.au/en/about/policies/child-safe-policy).

### Role Overview

The role of Research Scientist/Engineer staff is to conduct innovative research leading to scientific achievements that are aligned with CSIRO’s strategies. The Research Scientist/Engineer may be engaged in scientific activity ranging from fundamental research to the investigation of specific industry or community problems. The Research Scientist/Engineer 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.

CSIRO Agriculture & Food's Breeding Innovations Group requires a forward-thinking statistical machine learning expert to develop innovative solutions that address technology gaps, such as landscape scale optimisation of GxE interactions, epistasis and multi-objective breeding to support accelerated crop breeding and pre-breeding platforms for the Australian crops industry. The Research Scientist will deliver on externally funded research projects partnering with industry stakeholders on improved integration of diverse data sources including genetic (G), phenotypic (P) and environmental (E) data for genomic prediction and selection in canola, wheat and barley. The Research Scientist will also support internal, strategic innovation toward accelerating genetic gain in crop breeding and production systems.

The Research Scientist will be located in Canberra (ACT) and part of a team with other experts in statistical crop breeding. The Research Scientist will collaborate with researchers within CSIRO as well as external project partners including the University of Queensland, Australian National University, University of Western Australia and industry partners, including canola, wheat and barley breeding companies. The Research Scientist will be required to travel occasionally as part of these collaborations and to attend domestic and international conferences.

### Duties and Key Result Areas

* Carry out innovative research of strategic importance to CSIRO that will, where possible, address identified technology gaps and lead to novel and important scientific outcomes with a clear path to impact for the Australian crops industry.
* Draw on professional expertise, knowledge of other disciplines and research experience to recognise opportunities for innovation and generate new theoretical perspectives by pursuing new ideas or approaches and networking with scientific colleagues across a range of disciplines.
* Work collaboratively as part of a multi-disciplinary, regionally dispersed research team to carry out tasks in support of project objectives.
* Liaise with clients to determine their needs and take personal responsibility for client satisfaction.
* Manage, unify and analyse data using relevant data science techniques according to FAIR principles. Data streams will include canola, wheat and barley genotype and phenotype data as well as pedigree, environmental data sets. This will require close collaboration with members of the team and external partners.
* Undertake activities focused on one or more elements of larger research projects.
* Apply discretion to decide and implement strategies appropriate to the successful completion of work.
* Present results in a meaningful format, prepare reports for clients and/or write scientific papers for publication.
* Undertake experimental research activities and supervise/train others to ensure work is carried out in accordance with project plan.
* Provide supervision and coaching to students and technical staff.
* 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.
* Participate in identification of further opportunities which arise from research and initiate new lines of research.
* With the support of more senior researchers, assist in the planning and preparation of research proposals and carry out research investigations, requiring originality, creativity and innovation.
* Adhere to the spirit and practice of CSIRO’s Values, Code of Conduct, Health, Safety and Environment procedures and policy and diversity initiatives.
* Other duties as directed.

## **Selection Criteria**

#### Essential

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

1. A PhD in statistics, computational genetics (or an equivalent combination of qualifications and research experience) and relevant postdoctoral experience in the fields of Bayesian statistics, statistical machine learning, computational and quantitative biology, statistical simulation and optimisation.
2. Demonstrated experience applying statistical machine learning to solve complex multi-objective optimisation problems, including Bayesian evolutionary and Gaussian Process models, linear mixed models and generalised regression models.
3. Demonstrated ability to undertake original, creative and innovative research that expand the scale and performance of existing methods by generating and pursuing novel ideas and solutions to scientific research problems.
4. Practical knowledge of Australian crop breeding, specifically canola, wheat and/or barley.
5. Evidence of advanced programming skills in languages and statistical software packages relevant to biostatistics and bioinformatics (e.g. R, Python, Fortran, Matlab, SAS, Stata or equivalent) and experience in the use of high-performance computer resources and parallel computation.
6. Demonstrated skills in handling and analysis of large-scaled biological datasets for application in crop genomic prediction and selection to enable landscape scale optimisation of GxE interactions, epistasis and multi-trait selection.
7. Demonstrated experience handling different types and representations of genomic data (e.g. transcriptome, proteome, genome sequence, SNP), environment and other data modes (image, spectral, time series, spatial and temporal). Demonstrated experience working in multidisciplinary teams and handling multiple tasks and time management.
8. A demonstrated publication history of authorship on high quality scientific papers in peer reviewed journals and/or reports, grant applications or inventorship on patent applications.

**Desirable**

1. Demonstrated experience of supervising higher degree research students and student projects.
2. High level written and oral communication skills with the ability to represent the research team effectively internally and externally, including the presentation of research outcomes at national and international conferences.
3. Communicate complex analytical opportunities and novel developments with potential to create innovation in the application domain to a range of non-specialist stakeholders, including industry experts and end users.

## **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:** 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 responses 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 change.

Special Requirements

Appointment to this role is subject to provision of a pre-employment background check and may be subject to other security/medical/character clearance requirements.

* The successful candidate will undertake a pre-employment background check. Please note that individuals with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
* The successful candidate will be required to undertake a pre-employment medical examination prior to commencement.
* If the successful candidate is not an Australian Citizen or Permanent Resident, they 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 solve the greatest challenges through innovative science and technology. Visit [CSIRO Online](http://www.csiro.au/) 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