# backgroundData 61 and CSIRO logoPostdoctoral Fellow – CSOF4

Role summary for potential applicants

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| Advertised Job Title**:** | Postdoctoral Fellow in Augmented Reality for Decision Support |
| Reference Number**:** | 29563 |
| Classification**:** | CSOF4  |
| Salary Range: | AU $78,479 to AU $88,787 plus up to 15.4% superannuation  |
| Location**:** | Canberra |
| Tenure: | Specified Term of 3 years |
| Relocation assistance**:** | Will be provided to the successful candidate if required. |
| Applications are open to: | All Candidates |
| Functional Area**:** | Research Scientist / Engineer - Postdoc |
| Number of Direct Reports: | 0 |
| Reports to the: | Team Leader – Quantitative Imaging |

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| **Role Overview:** |
| Future Science Platforms (FSPs) are a major new CSIRO initiative. FSPs are multi-year investments in frontier science that will reinvent and create new industries for Australia. [Digiscape](http://my.csiro.au/Business-Units/Future-Science-Platforms/Digiscape-FSP.aspx) is the FSP that is creating next-generation decision tools to transform the agriculture and land management sector. To achieve this aim, Digiscape will bring to bear cutting edge climate science; new sources of locally and remotely sensed data; informatics for agro-ecosystems; rigorous analysis of uncertainties; and innovation in both the ICT and social dimensions of systems integration. The successful candidate will join a cohort of early-career researchers and engineers who will combine their individual disciplinary contributions into mission-focussed R&D.Part of the Digiscape vision is that Augmented Reality technologies (such as Microsoft HoloLens) will play a key role in supporting individual and team decision making, both in the field and in the office. In the aquaculture domain these tools will assist operators on the ground in visualising pond conditions and in accessing short-term pond predictions across multiple ponds. They will be a primary method for accessing the data management and modelling frameworks developed in related projects. Importantly these tools will also decrease training times for new pond managers to facilitate production increases.**We are seeking a highly motivated PhD graduate with a passion for developing novel interactive Augmented Reality (AR) applications and a desire to have substantial impact in Aquaculture and Agriculture.**The successful applicant will contribute to solving a range of visualisation challenges in the aquaculture domain, making use of the Advanced Augmented Reality (AR) and Virtual Reality (VR) facilities in the Data61 Immersive Environments Lab in Canberra, working in the field, and collaborating widely within and outside of CSIRO. The outcomes from this project are intended to be more widely applicable across the agricultural sector.**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. |

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| **Duties and Key Result Areas:** |
| * Under the direction of senior research staff, carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes.
* Survey literature, attend workshops and collaborate directly with staff in the Aquaculture and broader Agriculture domains to understand and map the opportunities for AR technologies to act as the interface to new types of data.
* Carry out software engineering and programming for rapid prototyping of AR systems.
* Craft technology demonstrations that enable people to experience new application concepts, where possible using live/real data from the field.
* Contribute to commercialisation efforts, as required.
* Maintain an awareness of industry roadmaps and provide advice on upcoming technology direction.
* 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(s).
* 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 collaboratively with colleagues within your team, the business unit and across CSIRO.
* 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.
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| **Selection Criteria:** |
| *Under CSIRO policy only those who meet all essential criteria can be appointed.****Pre-Requisites:***1. **Education/Qualifications:** A doctorate (or will shortly satisfy the requirements of a PhD) in Computer Science, Engineering or a directly related field.

***Please note:*** *To be eligible for this role you must have* ***no more than 3 years*** *relevant postdoctoral experience.*1. **Communication:** Excellent communication skills, both written and oral, including the ability to anticipate the interests and knowledge level of an audience and present information and feedback accordingly**.**
2. **Behaviours:** A history of professional and respectful behaviours and attitudes in a collaborative environment.
3. **Adaptability:** The ability to effectively manage a number of competing priorities simultaneously, and carry out non-routine tasks under limited direction.
4. **Problem Solving:** Proven ability to investigate underlying issues of complex and ill-defined problems and develop appropriate responses by adapting/creating and testing alternative solutions**.**

***Essential Criteria:***1. *Demonstrated experience in conducting research in interactive 3D graphics and/or computer vision, more specifically in the area of Virtual Reality, Augmented Reality and/or Web3D.*
2. *High level written and oral communication skills demonstrated through publications and collaboration with the ability to represent the research team effectively internally and externally, including at national and international conferences.*
3. *Demonstrated experience building interactive software with one or more programming languages such as: Javascript, C++, C#, Python, Matlab.*
4. *The ability to work effectively as part of a multi-disciplinary, regionally dispersed research team, and carry out tasks autonomously.*
5. *Familiarity with modern computer graphics engines such as Unity or Unreal and/or familiarity with Graphics Libraries such as OpenGL, Vulkan or DirectX.*
6. *A record of science innovation and creativity along with the ability & willingness to contribute novel ideas and approaches in support of scientific investigations*.
7. *Willing and able to travel on occasion to conferences, fieldwork, meetings and other events.*

**Desirable Criteria:**1. *Entrepreneurial and Innovative*
2. *Established and expanding professional network*
3. *Hunger for professional development*
4. *Experience with Web and/or distributed systems as well as an appreciation of open web standards such as HTML 5, WebGL, WebRTC, X3D, WebVR, etc.*
5. *Familiarity with modern front-end web frameworks such as Angular, React, Ember etc.*
6. *Familiarity with server-side web frameworks such as Node.js/Express, Ruby on Rails, Django etc.*
7. *Familiarity with Human Computer Interaction and/or Interaction Design concepts and methods*
8. *Familiarity with concepts of human visual perception and optics*
9. *Familiarity with 3D Modelling Packages*
10. *Familiarity with 3D Scanning and 3D Reconstruction technologies*
11. *Familiarity with Multimodal User interaction (Auditory, Haptics, etc.)*
12. *Familiarity with GIS technologies and techniques*
13. *Experience implementing mobile applications*
14. *Experience implementing simulations on GPUs*
15. *Experience with statistical methods*
16. *Aptitude for 3D mathematical concepts, particularly linear algebra*

***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 can 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>**CSIRO:**As Australia’s Innovation Catalyst, CSIRO has strategic actions underpinned by behaviours aligned to Excellent science, Inclusion, trust & respect, health, safety & environment and delivering on commitments.  In your application and at interview you will need to demonstrate alignment with these behaviours.In Data61, our leaders will be expected to demonstrate the following values:1. **Hierarchy**: Country, Company, Team, Individual
2. **Openness**: Open debate, collaboration, full commitment
3. **Learning**: Calculated risks, institutionalise learning, fast cadence
4. **Impact**: Tackle hard problems, create the future, focus on outcomes
5. **Stewardship**: Lead, make each function and co. stronger over time

***Other special requirements:****Appointment to this role may be subject to conditions including security/medical/character clearance requirements. Applicants who are not Australian Citizens or Permanent Residents may be required to undergo additional security clearance processes; which may include medical examinations and an international standardised test of English language proficiency (i.e. IELTS test).-* [*http://www.ielts.org/default.aspx*](http://www.ielts.org/default.aspx) |

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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). Please upload your cover letter and resume/CV as one document. Please provide sufficient relevant information to enable the selection panel to assess your suitability. Should your application proceeds to the next step, 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.**Academic Transcripts**: If you are a recent graduate, please ensure you provide an academic transcript.**Contact:**If after reading the selection documentation you require further information please contact: Matt Adcockvia email: Matt.Adcock@csiro.au or phone: +61 2 6216 7098.Please do not email your application directly to Matt Adcock. 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). **CSIRO Data61**In today’s data-focused world, there’s no doubt that numbers count. [**Data61**](http://www.data61.csiro.au/) are the largest data innovation group in Australia, a connector that brings together technology innovators, businesses and universities to transform Australian industry and to help solve our greatest challenges. A CSIRO business, we are creating our data-driven future. Find out more: [www.data61.csiro.au](http://www.data61.csiro.au) |