Position Details

Research Projects - CSOF5

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| The following information is for applicants | |
| Advertised Job Title | Senior Software Engineer |
| Job Reference | 64261 |
| Tenure | Indefinite  Full-time |
| Salary Range | CSOF5 - AU $98,735 to AU $106,848 pa (pro-rata for part-time) + up to 15.4% superannuation  CSOF6 - AU $113,338 to AU $132,811 + up to 15.4% superannuation |
| Location(s) | Eveleigh, NSW |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | Australian/New Zealand Citizens and Australian Permanent Residents Only |
| Position reports to the | Team Leader |
| Client Focus – Internal | 25% |
| Client Focus – External | 75% |
| Number of Direct Reports | 0 |
| Enquire about this job | Ben Itzstein, ben.itzstein@data61.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. |

**Role Overview**

The role of Software Engineering staff in CSIRO is to support innovative research and scientific achievements, by bringing innovation out of the lab and into the real world, through product development and platform engineering.   
  
This role will see you working as a senior back-end developer and dev-ops practitioner within a software engineering team, working on projects in transport and data city domains, and leveraging the innovation and talent of the Transport Analytics group. This role will particularly focus on Structural Health Monitoring (SHM) and Digital Twin (DTw) projects, including the maintenance and development of existing SHM platforms, data services, predictive maintenance services, and web dashboards, as well as potentially contributing to new product development for government, industry or community. We are seeking a strong back-end developer, preferably with experience in modern web service technologies, big data and streaming data integrations, as well as cloud dev-ops. The right candidate should have a passion for sharing, learning and contributing to a healthy software engineering culture.  
  
The Transport Analytics Group (part of the Data Analytics and Decision Sciences research program) is Data61's research and development arm for providing data-driven solutions for smart planning, implementation and management of infrastructure and future transport. They enhance conventional tools using data-driven techniques, which positions the group to complement existing products and services in the market. Their solutions involve ML/AI-based surrogate models that can replace or augment computation-intensive physical models, whether for real-time prediction of traffic congestion propagation or streaming analytics on structural health of critical infrastructure.

The Transport Analytics group’s Sydney Harbour Bridge SHM platform has almost 3000 sensors and the ADAIT transport data analytics platform handles millions of daily data transactions. This includes real-time streaming data from traffic control systems, transport operation systems, sensors and journey transactions. The platforms host predictive analytics modules that derive actionable insights from data for intelligent asset and journey management.

The group has been recognised by prestigious awards, including the ITS Australia National Award for Research (2014, 2015, 2018), AIIA iAwards (2019), Committee for Sydney Smart City Awards (2018) and CSIRO Collaboration Medal (2018). The group has ongoing collaborations with numerous government agencies, research institutes and industry partners. Additional information on the group can be found at: <https://adait.io>

**Duties and Key Result Areas:**

* Design and develop software modules for researchers and clients, with a focus on back-end web services, data processing pipelines and applied machine learning;
* Contribute to the maintenance, development and operation of Structural Health Monitoring / IoT platforms;
* Review security and quality of software;
* Write and maintain tests;
* Assist in the delivery of data analytics platform capabilities;
* Communicate effectively and respectfully in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation;
* Work effectively as part of a multi-disciplinary research team to undertake independent scientific investigations and carry out associated tasks under the guidance of stakeholders and senior team members;
* Be comfortable working collaboratively and with integrity, with internal and external colleagues, clients and partners to help define and satisfy objectives for small- to medium-scale research & development projects;
* Provide coaching and on-the-job training to technical staff and students, to ensure work is conducted in accordance with expectations;
* Other duties as directed.

**For appointment at the higher salary level (CSOF6), duties will also include:**

* Take a leading role in the improvement of existing Structural Health Monitoring platforms, and the design and roll-out of future SHM/IoT platforms;
* Contribute to dev-ops tooling and take responsibility of some operational aspects supporting SDLC and platform delivery, e.g. CI, deployments and monitoring;
* Assist with the development of project proposals or solution designs, including requirements gathering, solution architecture, negotiation of resources and effort estimations;
* Liaise with researchers, vendors and clients to ensure solution design and delivery meets all stakeholder expectations.

**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 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.

**Selection Criteria**

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

***Essential Criteria:***

1. Solid engineering and software development skills, with experience writing scalable, high performance, production quality code;
2. Proficient in back end development, using for example Python, Java, Scala, Ruby or equivalent;
3. Experience with REST API design and development, preferably using Spring Boot framework;
4. Experience with contributing to the development, deployment and operation of microservices architectures;
5. Proficient with data storage and processing, for example: PostgreSQL, Cassandra, Kafka, Spark, Flink, Hadoop;
6. Understand software development life cycles and have experience in designing, building, testing and delivering reusable and extensible commercial products.

***Additional essential criteria for CSOF6 appointment:***

1. Experience with big data architectures (particularly time-series data) and processing big data in batch and streaming applications;
2. Experience with production deployments and operational considerations within cloud and hybrid cloud environments;
3. Working knowledge of networking and security in hybrid cloud platforms;
4. Experience with dev-op tools and their application to continuous integration and deployments, e.g. Docker, Continuous Integration/Delivery, Infrastructure-as-code, AWS cloud SDK;
5. Demonstrated success with leading the design, development and delivery of complex software projects.

**Desirable Criteria:**

1. Familiarity with AWS cloud architecture, and the ability to manage parts of a hybrid cloud platform;
2. Experience with GIS data processing and analysis, particularly using open source tools;
3. Experience with designing solution architectures, particularly using microservices;
4. Experience with real-time and historical time-series data;
5. Experience with applied machine learning;
6. Experience with using Docker, particularly in distributed environments;
7. Working knowledge of front-end development, especially within web applications using modern technologies, e.g. node.js, VueJS, Angular, React, ngrx/store.

**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 Check or equivalent. Please note that people with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
* 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. To find out more visit us [online](http://www.csiro.au/)!