# Position Description

## Research Scientist/Engineer – CSOF6

The following information is for applicants

|  |  |
| --- | --- |
| Advertised Job Title**:** | Senior Research Scientist - Transport Analytics |
| Job Reference: | 60044 |
| Relocation Assistance**:** | Will be provided to the successful candidate if required. |
| Applications Are Open To: | Australian/New Zealand Citizens and Australian Permanent Residents Only |
| Percentage of Client Focus - Internal: | 50% |
| Percentage of Client Focus - External: | 50% |
| Reports to the: | Team Leader |
| Number of Direct Reports: | TBC |
| Name and Contact Details For Applicant Enquiries | Dr Chen Cai  Email: [Chen.Cai@csiro.au](mailto:Chen.Cai@csiro.au)  Phone +61 2 9490 5531 |
| Contact Details For Applying | Call 1300 984 220 or email [careers.online@csiro.au](mailto: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  Please do not email your application directly to Dr Cai.   Applications received via this method will not be considered by the selection panel. |

## Role Overview:

Advanced Data Analytics in Transport (ADAIT) is a research and development team within the Analytics program in CSIRO’s Data61. Data61 is Australia’s leading data innovation group which partners with universities in Australia and corporate and government structures in order to create Australia’s data-driven future.

Since its inception in 2013 ADAIT won the ITS Australia National Award on Research in 2014 and 2015 consecutively. It won the prestigious NSW Premier’s Innovation Initiative in 2015 to deliver predictive modelling capabilities for congestion management in Sydney. It became a core partner in the TfNSW initiative for On-Demand Public Transport in 2017, with responsibilities on predictive data modelling. ADAIT has a long-term ongoing collaboration with NSW Roads and Maritime Services on a number of innovation projects. ADAIT has strong partnerships with the ITS industry in Australia. It explores with partners on realising the potentials of Data Science and AI in business innovations. Additional information on ADAIT can be found at [www.adait.io](http://www.adait.io)

ADAIT’s transport data analytics platform handles more than 800 million data transactions on daily basis. This includes real-time streaming data from traffic control systems, transport operation systems and data bundles on journey transactions. The platform hosts predictive analytics modules that derive actionable insights from data for intelligent congestion and journey management.

In the role of the Senior Research Scientist – Transport Analytics you will draw on your professional expertise and research experience to develop and deploy machine learning models for the operations of multi-modal transport, intelligent mobility services and transport network management. The incumbent will have opportunities to work with a team of research scientists and collaborate with external universities and research entities (as circumstances require); to investigate research oriented problems.

## Duties and Key Result Areas:

* Incorporate novel approaches to scientific investigations by adapting and/or developing original concepts and ideas for new, existing and further research.
* Propose innovations and publish research papers on work related subjects.
* Design, develop and maintain predictive machine learning models.
* Design, develop and maintain software and toolkits in raw data analytics, model calibration, model verification and visualisation.
* Integrate machine learning models into the ADAIT platform.
* Maintain high standard and high reliability of deliverables.
* Support development on commercial projects.
* Communicate effectively and respectfully in the interests of good business practice, collaboration and enhancement of CSIRO's reputation.
* Produce high quality scientific and/or engineering papers suitable for publication in quality journals and for presentation at national and international conferences.
* Work effectively as part of a multi-disciplinary research team to undertake independent scientific investigations and carry out associated tasks under the guidance of more senior Research Scientists/Engineers.
* Leading research projects, including the negotiation of resource requirements.
* Provide coaching and on-the-job training to technical staff and students to ensure experiments are established in accordance with research design.
* 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: Identifies critical stakeholders and influences them via an influential third party, for example through an established network, to gain support for sometimes contentious proposals/ideas.**
3. **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.**
4. **Judgement and Problem Solving:** Anticipates and manages problems in ambiguous situations. Develops and selects an appropriate course of action and provides for contingencies. Evaluates, interprets and integrates complex bodies of information and draws logical conclusions, synthesises proposals and defends options with reasoned arguments.
5. **Independence: Assesses the risk and opportunity of identified strategies, options and actions. Overcomes problems and setbacks in achieving goals. Invariably includes consideration of value-added future impact on bottom line when determining the optimal and efficient use of resources.**
6. **Adaptability:** Demonstrates flexibility in thinking and adapts to, and manages, the increasing rate of organisational change by adjusting strategies, goal and priorities.

## Selection Criteria:

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

1. A doctorate or equivalent research experience in a relevant discipline area, such as mathematics, computer science, machine learning, artificial intelligence or transportation science.
2. Highly proficient in advanced mathematics including but not limited to constraint programming, graph theory, stochastic process and Bayesian inference.
3. Demonstrated record of applying mathematical solutions to machine learning problems, e.g. Bayesian Networks, Natural Language Processing, Image Processing, Recommendation Systems, and etc.
4. Strong programming skills in either C++, Java, Python, R, or MATLAB.
5. **The ability to work effectively as part of a multi-disciplinary, regionally dispersed research team, and carry out independent individual research, to achieve organisational goals.**
6. A record of science innovation and creativity plus the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## Desirable Criteria:

1. Good understanding of transportation science.
2. Experience and skills on transport modelling.
3. Experience on software development.
4. Worked on commercial projects related to business consulting.

## 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/)