National Industry PhD Program: Feature-based Transfer for Optimization of Water Infrastructure

Adelaide University and Optimatics Solutions invite applications for this industry PhD project, developing new techniques in water infrastructure optimization.

Program overview

Degree

Doctor of Philosophy

Research area

Computer Science

Academic supervisor

Prof. Frank Neumann

Industry partner

Optimatics Solutions

Expected commencement

2026

The successful candidate will receive:

- Admission to a PhD program at Adelaide University;
- **An Adelaide University Research Scholarship for 4 years, paid at $56,135 p.a., and a tuition fee waiver;**
- Supervision from research specialists at Adelaide University and Optimatics Solutions;
- Industry embedment with Optimatics Solutions; and
- Access to professional development opportunities through the University's Graduate Research and Innovation Training program.

Project Details

Optimization of water infrastructure is an established field of research with broad commercial applications. Computational search is routinely applied to infrastructure planning with outcomes far superior to manual planning. However, the scale of industrial problems is growing rapidly, which significantly increases the overall time to find good solutions. Moreover, planners often a need to iteratively refine the formulation of an optimization problem as business requirements come into focus. These challenges are not easily met by current optimization frameworks, which take a long time to run when problems are large.

This project addresses problems of scale by extracting key descriptive features of water networks in an optimization run and using these features to guide current and future optimization runs. This work leverages recent advances in the fields of Evolutionary Computing and Machine Learning. It is expected that this work will have immediate impact in terms of improving optimization frameworks at Optimatics Solutions.

This project will be undertaken in collaboration with Prof. Frank Neumann of the School of Computer Science and Information Technology, and research specialists at Optimatics. The student will be co-located at Adelaide University's City Campus and Optimatics' Adelaide site.
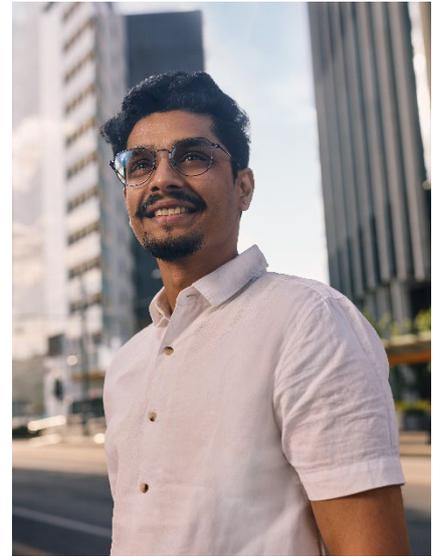
Eligibility Requirements

This opportunity is open to candidates who can meet the requirements for PhD admission at Adelaide University (including English language proficiency in the relevant academic area), and who can demonstrate suitable experience in computer science or machine learning (through a high-quality Honours or Masters degree).

In addition, the successful applicant should be able to demonstrate the following attributes:

1. Knowledge in optimization of large-scale and industrial problems. Some knowledge and experience in using evolutionary search. High-level knowledge of the domain of infrastructure planning.
2. Fluency in programming and using machine learning frameworks would be an advantage. Knowing more than one programming language,

particularly python, R, and JavaScript would help. A high-level understanding of linear algebra, linear and nonlinear regression and matrix algebra would be ideal.

3. We would also expect the candidate to be capable of clear technical writing and skills in presenting results to both a technical and general audience.

The successful candidate must be able to enrol as a full-time PhD student at the University in the year of the offer. They must remain based in Adelaide, South Australia for the duration of the award.

Students that have previously completed a PhD program are, unfortunately, ineligible for the National Industry PhD Program.

Application Process

To apply, please email the following documents to principal supervisor Prof. Frank Neumann (frank.neumann@adelaide.edu.au) with the subject line 'National Industry PhD Program application':

- CV
- Degree certificates and relevant academic transcripts, with translations of non-English documentation
- A list of publications (if applicable)
- English language proficiency results (if applicable)
- Names of two referees with their e-mail addresses

Applications close on **27 February 2026**. Please note that applications will be shortlisted on a rolling basis, and the scholarship advertisement may be withdrawn early if a suitable candidate is identified.

About the National Industry PhD Program

The National Industry PhD Program is an Australian Government initiative to enhance workforce mobility among graduate researchers, and to promote knowledge transfer between

academia and industries across all areas. PhD candidates under this program are connected with academic supervisors and industry-based researchers, to co-design innovative, applied research projects. Through their doctoral candidature, students will experience research in both university and industry settings, and undertake specialised training in research translation and commercialisation.

Enquiries

For enquiries about this opportunity please contact Prof Frank Neumann: frank.neumann@adelaide.edu.au

General Enquiries

For further information about the National Industry PhD Program, or research degrees at Adelaide University, please contact the Adelaide University Graduate Research School

Adelaide University