

# Industry PhD Scholarship: Transformer Architectures as Lossy Data Stores

**Adelaide University and the Department of Foreign Affairs and Trade invites applications for this industry PhD project, optimising transformer architectures.**

## Program overview

### Degree

Doctor of Philosophy

### Research area

Computer Science

### Academic unit

Australian Institute for Machine Learning

### Industry partner

Australian Department of Foreign Affairs and Trade

### Expected commencement

2027

## The successful candidate will receive:

- Admission to a PhD program at Adelaide University;
- An Adelaide University Research Scholarship;
- Supervision from research specialists in the School of Computer Science and Information Technology and the Department of Foreign Affairs and Trade;
- Opportunities for industry embedment; and
- Access to professional development opportunities through the University's Graduate Research and Innovation Training program.

## Project details

Transformer architectures have the capacity to store enormous quantities of data in a lossy, compressed format. This project focuses on measuring a transformer-based neural architecture's capacity to reliably retain training (via weights) or context-window (via engrams) data, aiming to develop a novel data store for messy, unstructured data with inference-time semantic retrieval and integrated entity resolution.

Example questions to solve include:

- What percentage of training data is unrecoverable from the weights?
- Is data loss consistent across the dataset, or do specific data attributes make it more or less likely to be forgotten?
- What is the optimum ratio of training dataset size to model parameter count for maximum data retention?

This project will explore novel transformer architectures, engrams, data pre-processing techniques, and novel post-training phases to identify architectures and processes that optimise data retention.

This project will be undertaken in collaboration with research supervisors from Adelaide University's School of Computer Science and Information Technology and the Department of Foreign Affairs and Trade. The student will be located at the Australian Institute for Machine Learning (Adelaide University City Campus East).



## Eligibility Requirements

This opportunity is open to Australian citizens that can meet the requirements for PhD admission at Adelaide University, and who can demonstrate suitable experience in computer science or a related field (through a high-quality Honours or Masters degree).

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.

## Expressions of Interest

To submit an expression of interest for this project please email the following documents to the Adelaide University Graduate Research School ([augrs.industry@adelaide.edu.au](mailto:augrs.industry@adelaide.edu.au)) with the subject line 'Industry PhD Scholarship: Transformer Architectures as Lossy Data Stores':

- CV
- Cover Letter (of not more than 2 pages) outlining your interest in the PhD project and describing how your background and research area align with the project

- Degree certificates and relevant academic transcripts, with translations of non-English documentation

The opportunity is open until filled. Applications will be assessed on a rolling basis, with the potential for multiple projects to be funded.

## **Enquiries**

For enquiries about this opportunity please contact the Adelaide University Graduate Research School:

E: [augrs.industry@adelaide.edu.au](mailto:augrs.industry@adelaide.edu.au)