# Adrian Orenstein CV

Full-time PhD Student in Computing Science, Artificial Intelligence and Reinforcement Learning.

## Education

### PhD in Computing Science

2023 - present
*The University of Alberta* and *The Alberta Machine Intelligence Institute (Amii)* Edmonton, Canada

I am advised by *Prof. Michael Bowling*. I want agents that can reason about how they use computational resources so that they can make better use of the compute power we give them.

### Masters in Computing Science, thesis based

2021 - 2023
*The University of Adelaide* and *The Australian Institute for Machine Learning (AIML)* Adelaide, Australia

I was advised by *Prof. Ian Reid*. My thesis was on representation learning for deep reinforcement learning. I improved how we optimise our agents' weights to take advantage of their access to diverse task-related experiences.

I was awarded the *Lockheed Martin Australia* (LMA) Scholarship.

### Bachelor of Computer Science (Artificial Intelligence Major)

2017 - 2019
*The University of Adelaide* Adelaide, Australia

My honours project was to improve hypertension diagnosis identification through machine learning using the Australian national general practice database.

My honours project was awarded the best oral presentation from the World Congress of Epidemiology.

Two additional awards were given for best presentation skills and the most innovative project at the Ingenuity Convention.

I was awarded the *The Cheong Choong Kong (CK) Scholarship* for being a leader in pastoral care, community building and being proactive against racism and discrimination.

## Academic Service

**Senior Reviewer** at RLC 2025 — 2025 Edmonton, Canada

**Workshop Co-Organiser** at RLC 2024 in the Finding the Frame Workshop — 2024 Amherst, USA

**RL1 2024** at *University of Alberta* — 2024 Edmonton, Canada

Designed a flipped classroom course with a postdoc

## Publications

1. **Orenstein, A.**, & Bowling, M. Agents can reason about their computational resources. In progress, 2025.
2. Howe, M., Bockman, J., **Orenstein, A.**, Podgorski, S., Bahrami, S., & Reid, I. The Edge of Disaster: A Battle Between Autonomous Racing and Safety. Oral presentation and accepted poster at the Workshop on Artificial Intelligence for Autonomous Driving in the International Joint Conference on Artificial Intelligence (IJCAI), 2022. Oral presentation at the Workshop on Safe Learning for Autonomous Driving in the International Conference on Machine Learning (ICML), 2022.

   We won 1st place in the learning-to-race competition hosted by Carnegie Mellon University.
3. Sachdeva, R., Hammond, R., Bockman, J., Arthur, A., Smart, B., Craggs, D., Doan, A.-D., Rowntree, T., Schutz, E., **Orenstein, A.**, Yu, A., Chin, T.-J., & Reid, I. D. Autonomy and Perception for Space Mining. Proceedings in the International Conference on Robotics and Automation (ICRA), 2022.

   We won an innovation prize for our team from the technology our team developed.

   The mission planner was integral to our team winning *3rd place out of 22 teams*, earning a $100,000 prize in the NASA Space Robotics Competition.
4. Bockman, J., Howe, M., **Orenstein, A.**, & Dayoub, F. AARK: An Open Toolkit for Autonomous Racing Research. Journal of CoRR abs/2410.00358, 2024.

   Under review at CoRL 2025

# Open source contributions

### GPU accelerated compressed replay buffers at *Pytorch TorchRL*

Summer 2025 Github

I got buyin from the lead maintainer of torchRL, Vmoens, to support compressing the data stored in replay buffers. This impacts deep RL applications that typically store 30GB of data on the accelerator, I merged code that reduced the memory storage by 95x-122x. See my *github issue*, with *feature implementation*, and *documentation with example code* pull requests.

**Tools**: Pytorch, TorchRL, TensorDict, Python

# Work Experience

### Data Scientist Internship at *Canva*

Summer 2021 Sydney, Australia

I delivered two projects that demonstrated to Canva that deep learning can deliver significant value to the business. Using deep learning, we can identify users reaching critical design phases and suggest new templates where coverage is poor.

**Tools**: Pytorch, Python, SQL **Data**: JSON, SVG, Real-time user data, Big Data

### Research Scientist Full-time at *The Australian Institute for Machine Learning*

2020 - 2021 Adelaide, Australia

Worked in a team of senior PhD researchers and professors to streamline the drilling and survey phase of mining.

Awarded “Most Innovative Modelling” of the problem for the using ground penetrating mineral analysis and deep learning.

**Tools**: Pytorch, Python **Data**: Geospatial data, RGB, ground penetrating radar

# Leadership

### RLAI Lab Manager

*RLAI Lab - The University of Alberta*

2024 - present
Edmonton, Canada

I make the RLAI lab working space a great working environment for students in collaboration with the department.

### Undergraduate Research Supervisor

*The University of Alberta*

2024 - present
Edmonton, Canada

I have supervised two groups of students:

- *Aditya Gupta* and *Jayesh Goyal* in Fall 2025 are using RL evaluation on the happiness of colonists in *RimWorld*.
- *Gwen Delos Santos*, *Jessica Chen*, and *Bayley Sapara* in Summer 2024 worked on the options framework in RL.

### Resource-Constrained Reading Group

*RLAI Lab - The University of Alberta*

2024 - present
Edmonton, Canada

I actively seek other researchers with interests in problems where agents need to deal with real-world problems that have finite time or computational power.

### AIML Community Cluster at *The University of Adelaide*

2022 Adelaide, Australia

I got buy-in from a senior PhD student to help me build a cluster so that students can complete their experiments faster.

### Undergraduate Research Supervisor

*The University of Adelaide*

2022 - 2023
Adelaide, Australia

I have supervised rising stars in computing science.

- *Jason Shen* streamlined the development of graphical machine learning applications using containerisation.
- *Emily Carey* used deep learning to identify cancer in medical MRI images during her summer internship at AIML.
- *Ren You* developed an image auto-encoder to restore old images to their original style.
- *Kosta Hassouros* developed a bot to learn to predict your GPS location given an image of your surroundings.

### Early Career Researcher (ECR) General Committee Member

*The Australian Institute for Machine Learning*

2020 - 2022
Adelaide, Australia

I want to improve the professional skills of the students around me. I ran interview preparation workshops and invited guest speakers to talk about the paper review process at my university.

### Computer Science Club (CSC) General Committee Member

2018
*The University of Adelaide*
Adelaide, Australia

I organised Google and Microsoft to come onto campus and deliver industry panels and hackathons.

### ECMS Academic Tutor

2018
*Lincoln College*
Adelaide, Australia

I was a leader in pastoral care, organizing professional trainers to run fitness sessions to accommodate student needs and building a VR game room for the students.

## Presentations

### Introduction to Transformers and Compilers

2024
*The University of Alberta*
Edmonton, Canada

I built a strong relationship with *Prof. Nelson Amaral* where I am an active member of his lab.

## Open-Source Software

### *(2023) NASA SpaceApps Challenge - Team Ker-boom*

Developed an AI research platform using *Kerbal Space Program (KSP)* to simulate challenging scenarios in space. Successfully used AI to de-tumble satellites in a simulated cube-satellite orbiting the Earth.

### *(2023) Adelaide Autonomous Racing Challenge*

Developing an AI research platform using *Assetto Corsa* to simulate challenging scenarios in racing.

### *(2021) Docker Pytorch Template*

I maintain an open-source github template to speed up research and encourage reproducibility of results.