

CURRICULUM VITAE

Taran Allan-McKay

taranallanmckay@email.carleton.ca | (416) 838-1783

Education

B.COG.SC. Honours, Carleton University 2025

Major: Cognitive Science with Concentration in Cognition and Computation

Specialization: Artificial Intelligence and Cognitive Modelling

Minor: Neuroscience and Mental health

- Final CGPA: 11.88/12

Scholarships and Awards

Senate Medal for Outstanding Academic Achievement 2025

Carleton University Research Opportunity Program 2023
(CUROP) Award

- Supervisor: Dr. Mary Kelly
- Amount: \$7,000

Deans' Honour List 2020-2025

Faculty Scholarship 2020-2025

- Renewable entrance scholarship
- Amount: \$4,000

Projects

Codenames as an Interactive Test for Large Language Model Theory of Mind (Undergraduate Thesis) 2024-2025

Role: Research Lead

- Conducted a comprehensive literature review and mapped findings across human and artificial Theory-of-Mind research, analyzing underlying cognitive mechanisms and identifying open questions.
- Designed an interactive game-based evaluation framework and automated Python pipeline to test LLM Theory-of-Mind reasoning in flexible, domain-general tasks, overcoming limitations of classic story-based tests.
- Synthesized empirical findings that support the conclusion that LLM reasoning remains primarily associative, lacking the top-down executive control mechanisms necessary for human-level causal reasoning.

Resource-Capturing Boids with Dynamic Leadership (Class Project) 2025

Role: Co-lead

- Co-designed a multi-agent reinforcement learning (MARL) project using VMAS to investigate dynamic vs. static leadership in cooperative swarm agents.
- Implemented and trained agents with MAPPO policies, integrating GNN-based network representations of agent interactions.
- Evaluated agent behavior using standard MARL benchmark evaluations and drew conceptual conclusions about leadership emergence and team coordination.

Uncontrollable: The Threat of Artificial Superintelligence and the Race to Save the World by Darren McKee (Book) 2023

Role: Research Assistant

- Identified real-world examples of AI harms and benefits, organizing them to highlight broader patterns, societal implications, and underlying theoretical concerns of AI deployment.
- Translated technical AI concepts, including neural networks and transformers, into accessible explanations for general audiences, highlighting interpretability issues.
- Managed citations and research notes, ensuring coherence, traceability, and organization across the manuscript.

To Bluff or Not to Bluff: Using Deep Reinforcement Learning Agents in Bluffing Game Environments (Class Project) 2025

Role: Co-lead

- Designed a partially observable adversarial game environment to test strategic bluffing behavior in deep RL agents.
- Implemented and trained deep RL agents (feedforward, RNN, LSTM) in Keras using DQN, experience replay, and the Adam optimizer.
- Evaluated agent performance against baseline agents, analyzing win rates, behavioral adaptation, and interactions to draw insights into strategy and learning dynamics.

Snake World (CUROP Research Project) 2023

Role: Research Lead

- Independently designed and implemented a Python-based RL environment and agent, exploring perverse incentive dynamics (“cobra-hacking”) and agent adaptation.
- Demonstrated conceptual proficiency in RL by analyzing emergent strategies and reward exploitation, highlighting deeper principles of agent behavior.

Other Experience

Carleton Undergraduate Journal of Cognitive Science (CUJCS) 2023-2025

Role: Founder and Editor-in-Chief.

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- Oversaw and orchestrated the creation of a cohesive collection of editorial articles. Tasks included interviewing, writing, editing, and conducting extensive research.
 - Edited student submissions.

Adaptive Neuromorphics, Intelligence, Memory, and Unified Systems (ANIMUS) Lab 2022-2025

Role: Lab Member

- Attended weekly lab meetings.
- Contributed to the design and executing of various ongoing projects.

Carleton Cognitive Science Association (CCSA) 2022-2023

Role: President

- Oversaw the entire CCSA team, lead meetings, hosted events, completed administration tasks and designed community events and project.

Carleton Faculty of Arts and Social Sciences (FASS) 2023-2025

Role: Student Ambassador

- Represented the Cognitive Science Department at various events.
- Assisted in program-focused recruitment efforts.

Carleton Cognitive Science Cyclical Program Review Mar 2024

Role: Student Representative

- Selected to meet with external reviews to discuss the undergraduate Cognitive Science program at Carleton University.