Ewan Jordan

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Education

University of Toronto, BSc. (Hons) Candidate

Specialist in Computer Science, Major in Cognitive Science & Minor in Mathematics

- Relevant Coursework: Cognitive Neuroscience (*IPR*), Behavioral Neuroscience, Machine Learning, Natural Language Processing(*IPR*), Cognitive Psychology, Intr. Artificial Intelligence, Algorithm Design & Analysis, Multivariable Calculus, Probability & Statistics I, Linear Algebra I&II
- Cumulative GPA: **3.79**/4.00, Recent Sessional GPA: **4.00**/4.00, Dean's Scholar (2022, 2023, 2024)
- Extracurriculars: NeuoTech UofT Bioengineering Team, UTMIST, Trinity College Intramural Team Captain (Ultimate/Football), Trinity College Chess Club Organizer

RESEARCH EXPERIENCE

Research Assistant | UTSC CoNSens (Matthias Niemeier)

- Led comparative research into artificial and biological neural networks to advance the understanding of visual information processing in the brain by developing a novel map-based artificial neural network (ANN) to **model dorsal and ventral stream functions**. Revealed task-specific differences in ANN optimization that mirror neural processing, offering insights into how the brain integrates perception and action.
- Designed, implemented and trained a novel multitasking (object recognition/grasp identification) deep convolutional neural network in PyTorch and performed contemporary XAI techniques including Neuron Shapley Analysis, Guided Backpropagation and Activation Maximization.
- **Processed experimental EEG data** on classification and grasping tasks and compared to the artificial model's activations using **Representational Similarity Analysis**.
- Simulated Melvyn Goodale's 2003 experiment on visual control with my trained artificial network, including generating a novel $\sim 60,000$ image dataset.

Undergraduate Researcher | Computational Social Science Lab (Ashton Anderson) April 2024 – Present

- Researched the impact of Large Language Models (LLMs) on human creativity, designing and conducting two large-scale experiments with 1,100 participants to evaluate the effects of AI assistance on divergent and convergent thinking.
- Findings contributed to understanding the trade-offs of AI-enhanced creativity, uncovering potential risks of cognitive homogenization and diminished independent creative performance, and informing design principles for **co-creative AI systems**.
- Designed and implemented the experimental interface using NodeJS and Prolific, conducted data analysis and formalized ideas and discussions for publication.

ACADEMIC WORKS

Kumar H, Vincentius J, Jordan E, Anderson A. Human Creativity in the Age of LLMs: Randomized Experiments on Divergent and Convergent Thinking (Under Review) CHI Conference on Human Factors in Computing Systems 2025

• Measured the residual effects of LLM usage on the creativity of human users in an experimental setting within three different conditions (No LLM, Unconstrained LLM, Coach-like LLM) and two differing tasks (Alternate Uses Task, Remote Associates Task).

Reza T, Luo S, Jordan E, Tang J, Patel K, Niemeier M. Emergence of Dorsal-like and Ventral-like Properties in Artificial Neural Networks (Poster) Society for Neuroscience 2024

- Investigated the differences between the brain's dorsal and ventral visual processing streams by developing a novel ANN that performs both object recognition and grasp planning, finding that task-specific optimization leads to dorsal and ventral stream-like properties in the ANN, with varying feature importance across layers and a strong similarity between model activation and EEG data in early visual processing.
- Project is currently under review for COSYNE 2025 (Co-Author for this submission)

Jordan E Comparative Studies of Artificial and Biological Neural Networks Final Report for PSY493: Cognitive Neuroscience

• Examined literature on the comparison between artificial neural networks (ANNs) and brain networks, focusing on how ANNs model visual processing, the challenges of aligning them with brain activity, and future research directions to enhance their biological relevance.

Toronto, ON Sep. 2021 – June 2025

April 2024 – Present

TECHNICAL EXPERIENCE

ML/AI Software Developer | University of Toronto

- Researched and developed methods for integrating generative AI feedback into intro CS course submissions within MarkUs (UofT CS submission application) under the supervision of teaching stream faculty; Karen Reid, David Liu and Alice Gao.
- Developed a robust framework in Python for running local LLMs and analyzing outputs given various different prompting techniques (Few-shot, Chain-of-thought, RAG, Iterative Refinement etc.).
- Worked closely with course TAs to engineer prompts that result in meaningful, student-oriented feedback.

Full Stack Developer/Co-Founder | Rewild it

March 2024 - Present

May 2024 – August 2024

- Created a map-based mobile application for users to coordinate grassroots environmental restoration projects in their communities.
- Collaborated with the Toronto Region Conservation Authority and Civil Engineering Professor, Tamer El-Diraby, to gain professional insights for the the use of the platform in urban areas and in assistance in outreach/deployment.
- Developed a multi-platform interface using React Native and Expo Go, as well as a custom REST API & database using Go, Postgres and AWS EC2.

Awards & Achievements

- Arthur and Susan Scace Award (2023, UofT Non-Recurring Scholarship). Total Awarded: \$7,800
- 2nd Place: School of Cities Youth Civic Engagement App Competition (2024). Total Awarded: \$6,500
- 7th Place: Daisy Intelligence Hackathon (2022)

Other Projects

- Summer Camp Scheduler (*Node.js, React*) Developed a full-stack enterprise web application for York Region Educational Services, featuring an optimized scheduling algorithm based on a constraint satisfaction problem formulation. (2023)
- Intelligent Employer Profiling Platform (*Python, SciPy, Selenium*) Profiled over 50 employers on metrics like pay, equality and workload using sentiment analysis and text classification of Glassdoor and Indeed reviews. (2022)
- COVID-19 Socio-Economic Modelling (*Python, Selenium*) Discovered negative correlation between local COVID-19 case intensity with socioeconomic standing across Toronto neighbourhoods. (2021)

TECHNICAL SKILLS

Languages: Python, C/C++, JavaScript, MatLab, Java, Go, R, C# Libraries: PyTorch, NumPy, Matplotlib, scipy, pandas, SQLAlchemy, Beautiful Soup, Openai API, Deep Learning Toolbox, eeg-processing-toolbox Frameworks: React, Next.js, Flask, Node.js, Selenium, Bootstrap

Developer Tools: Git, Docker, Amazon Web Services, Unix, SLURM