

Natalia Espinosa Dice

Education

- Expected May 2028 **Master's (Thesis), Computer Science, McGill University**
Advisor: Prof. Siamak Ravanbakhsh
Research Areas: Reinforcement Learning
- May 2026 **B.S.E, Computer Science, Princeton University**
Advisor: Prof. Tom Griffiths
Major: Computer Science; *Minors:* Cognitive Science, Latin American Studies
GPA: 3.9; *Honors:* Magna Cum Laude, Tau Beta Pi, Sigma Xi

Research Experience

- 2026–
Present **Department of Computer Science, McGill University and MILA**
Advisor: Prof. Siamak Ravanbakhsh
Research Areas: Reinforcement Learning
- 2025–2026 **Computational Cognitive Science Lab, Princeton University**
Advisor: Prof. Tom Griffiths
Research Areas: Reinforcement Learning
- Developed curriculum learning and progressive neural network methods to mitigate catastrophic forgetting across stages.
 - Completed senior thesis on learning long-horizon humanoid locomotion in high-dimensional continuous control, where naive exploration is infeasible.
 - Developed a hierarchical RL framework that leveraged insights from human motor development to decompose locomotion into tractable postural skills and train a high-level policy to coordinate them, outperforming existing RL and HRL baselines.
- Summer 2025 **Health Information Privacy Lab, Vanderbilt University**
Advisor: Prof. Brad Malin
Research Areas: Synthetic Data Generation, Reinforcement Learning
- Led a project to design an inverse reinforcement learning-based generative model for privacy-preserving synthetic health data under limited training samples.
 - Benchmarked and achieved competitive performance against existing state-of-the-art generative adversarial networks and diffusion models.
- Fall 2024 **Independent Work, Princeton University**
Advisor: Prof. Xiaoyan Li
Research Areas: Machine Learning for Social Science
- Built XGBoost and Random Forest models to forecast Colombian drug trafficking hotspots using socioeconomic indicators and engineered time-series features.
 - Identified key drivers such as crime rates and urban-rural population dynamics, offering an empirical analysis of existing sociopolitical theories.
- Summer 2024 **School of Information Sciences, University of Macedonia**
Advisors: Prof. Eftichios Protopapadakis, Prof. Christine Syriopoulou-Delli
Research Areas: Deep Learning, Representation Learning
- Led a project developing stacked autoencoders to learn latent representations for distinguishing autism from typical development within structural MRI data.
 - Investigated group-level neural differences by analyzing reconstruction error patterns across cross-tested models.

Industry Experience

- 2023–2024 **Research Intern, Dasion**
(Part Time) *Advisor: Dr. Weiqing Gu*
- Developed and refined a machine learning model for voice-based medical diagnosis that was adopted into ongoing company workflows.
 - Extended models to diseases including depression and diabetes.
- Summer 2023 **Machine Learning Engineer Intern, Dasion**
- Developed machine learning pipelines for voice-based medical diagnosis of autism, including robust preprocessing and advanced audio feature extraction.

Publications

- [1] N.J. Jackson, **N. Espinosa Dice**, C. Yan, Z. Li, X. Jiang, A. Lee, B. Malin. *A Synthetic Multi-modal Dataset for Type 2 Diabetes*. Under review, 2026.
- [2] N.J. Jackson, **N. Espinosa Dice**, C. Yan, and B. Malin. *Reward-Guided Generation Improves the Scientific Utility of Synthetic Biomedical Data*. Under review, 2026.
- [3] **N. Espinosa Dice**, N.J. Jackson, C. Yan, A. Lee, and B. Malin. *A Reinforcement Learning Approach to Synthetic Data Generation*. Journal of Biomedical Informatics, 2025.

Teaching and Outreach

- 2024–Present **Head Fellow, Princeton University, Writing Center**
- Hold one-on-one writing conferences with undergraduate and graduate students across disciplines.
 - Mentor and supervise a cohort of 7 fellows, and lead training for incoming fellows.
 - Lead workshops on scientific writing and host events introducing first-years to the research and writing process.
- 2024–Present **Editor-In-Chief, Princeton University, Tortoise Journal**
- Direct the publication of the Writing Center’s annual pedagogy journal, a fully student-run initiative.
 - Contribute editorial commentaries published alongside student work.
- Spring 2026 **Head Course Assistant, Princeton University, SML 354 Machine Learning**
- Head undergraduate course assistant for SML 354: Machine Learning: A Practical Introduction.
 - Grade assignments, hold weekly office hours and assist with course logistics.
- Fall 2025 **Mentor, Princeton University, Engineering Council Mentorship Program**
- Advise underclass engineering students on course planning and career development.
- Spring 2025 **Course Assistant, Princeton University, Intro. to Machine Learning**
- Graded assignments and held weekly office hours to support student learning.
- Fall 2024 **Course Assistant, Princeton University, Data Structures and Algorithms**
- Graded assignments and provided feedback to support student learning.
- 2023–2024 **Fellow, Princeton University, Writing Center**
- Conducted 50+ one-on-one writing conferences per semester with undergraduate and graduate students.
 - Completed extensive mentorship training and professional development workshops.
- 2023–2024 **Editor, Princeton University, Tortoise Journal**
- Selected and edited submissions in collaboration with student authors.
- 2022–2023 **College Mentor, UStrive**
- Mentored two high school students through the college application process.
 - Provided guidance on admissions strategy and detailed feedback on essays.

Honors

- 2026 **George A. Miller Prize in Cognitive Science**, *Princeton University*
Awarded annually to the best interdisciplinary senior thesis in cognitive science.
- 2026 **Sigma Xi Book Award**, *Princeton University*
Awarded annually to seniors who have demonstrated outstanding research ability.
- 2026 **Magna Cum Laude**, Princeton University
- 2026 **Sigma Xi**, *Scientific Research Honor Society*, Princeton University
- 2025 **Tau Beta Pi**, *National Engineering Honor Society*, Princeton University
- 2025 **Selected Student Panelist**, *Ivy-Plus Writing Consortium Conference*