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Natalia Espinosa-Dice
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Natalia Espinosa Dice

Education

Expected May 2028 — **Master's (Thesis), Computer Science**, *McGill University*
Advisor: Prof. Siamak Ravanbakhsh
Research Areas: Reinforcement Learning, AI Safety

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, AI Safety

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 (Part Time) **Research Intern**, *Dasion*
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*. Scientific Data, 2026.

[2] N.J. Jackson, **N. Espinosa Dice**, C. Yan, B. Malin. *Reward-Guided Generation Improves the Scientific Utility of Synthetic Biomedical Data*. Proceedings of the AMIA 2026 Annual Symposium, 2026. **KDDM Working Group Innovation Award (Winner)**.

[3] **N. Espinosa Dice**, N.J. Jackson, C. Yan, A. Lee, B. Malin. *A Reinforcement Learning Approach to Synthetic Data Generation*. Journal of Biomedical Informatics, 2026.

Teaching and Outreach

2024–2026 **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.

2024–2026 **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 **KDDM Innovation Award (Winner)**, *Knowledge Discovery and Data Mining Working Group*, American Medical Informatics Association (AMIA)
For "Reward-Guided Generation Improves the Scientific Utility of Synthetic Biomedical Data," AMIA 2026 Annual Symposium. One of two winning papers selected.

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 (10/200 computer science graduates).

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*