

Natalia Espinosa Dice

Education

Expected May 2026 **B.S.E, Computer Science, Princeton University**
Advisor: Prof. Tom Griffiths
Major in Computer Science with Minor in Cognitive Science (GPA: 3.86)

Research Experience

- 2025–Present **Computational Cognitive Science Lab, Princeton University**
Advisor: Prof. Tom Griffiths
Research Areas: Reinforcement Learning
- Led a project investigating how insights from human motor development can inform more efficient learning paradigms for humanoid locomotion.
 - Developed curriculum-based reinforcement learning methods and explored expanding neural network strategies to improve sample efficiency.
 - Leading an ongoing project on hierarchical reinforcement learning, in which modular developmental skills are trained individually and coordinated by a high-level value-based controller, to enable scalable and adaptive behavior in complex environments.
- Summer 2025 **Health Information Privacy Lab, Vanderbilt University**
Advisor: Prof. Brad Malin
Research Areas: Synthetic Data Generation, Reinforcement Learning
- Led a project to design a 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
- Led a project to apply stacked autoencoders to structural MRI data to learn latent representations for distinguishing autism from typical development.
 - 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 a machine learning model for voice-based medical diagnosis that was adopted into ongoing company workflows.
 - Applied models to diseases including depression and diabetes.

- Summer **Machine Learning Engineer Intern**, *Dasion*
2023
 - Developed pipelines for voice-based medical diagnosis of autism, including robust preprocessing and advanced audio feature extraction.
 - Contributed methods and results to NSF Phase I and II proposal submissions.

Publications

- [1] **Natalia Espinosa Dice**, Nicholas Jackson, Brad Malin. *Sample-Efficient Synthetic Data Generation via Reinforcement Learning*. Preprint, 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.

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
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 45+ 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 **College Mentor**, *UStrive*
 - Mentored two high school students through the college application process.
 - Provided guidance on admissions strategy and detailed feedback on essays.

Honors

- 2025 **Tau Beta Pi**, *National Engineering Honor Society*, Princeton University
2025 **Selected Student Panelist**, *Ivy-Plus Writing Consortium Conference*