Natalia Espinosa Dice

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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 (Part Time)
Research Intern, *Dasion*
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 2023
Machine Learning Engineer Intern, *Dasion*
- 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*