

# Drake Brown

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## Education

### PhD, Applied Mathematics

April 2029

University of Utah, Advisor: Bao Wang

Salt Lake City, Utah

- PhD Qualifying Exam Topics: ODEs, PDEs, Linear Models, Functional Analysis, and Numerical Analysis
- GPA: 4.00

### BS, Applied & Computational Mathematics Emphasis (ACME), Computer Science Minor

April 2025

Brigham Young University

Provo, Utah

- Major GPA: 4.00
- Relevant Coursework:

|                                           |                                   |
|-------------------------------------------|-----------------------------------|
| Advanced Deep Learning                    | Stochastic Differential Equations |
| Mathematics of Deep Learning              | Linear and Nonlinear Analysis     |
| Modeling with Uncertainty in Data         | Algorithm Design and Optimization |
| Modeling with Dynamics and Control Theory | Advanced Programming Concepts     |

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## Publications

- D. Brown et al. "Beyond Linear: A Theoretical and Empirical Analysis of Nonlinear GNNs for Community Detection." SIAM J. Applied Mathematics, in press (2026). First author.
- J. Keller et al. "Test-Time Guidance for Flow-Based Generative Models via Parallel Tempering on Source Distributions." ICML 2026, accepted.
- D. Brown, T. Garrity, D. Perkins, et al. "Optimal Control for Multi-Agent Sheep Herding." arXiv:2510.25115, 2025.
- D. Perkins, D. Hunter, D. Brown, et al. "Epidemiological Dynamics across Multiple Population Hubs." arXiv:2510.25085, 2025.
- Manuscript under review at NeurIPS 2026.

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## Skills

- Proficient in Python (PyTorch, Lightning, NumPy, Pandas), Java, C++, SQL, Rust
  - Generative Models
  - Optimal Control
  - Multi-Agent Systems
  - Graph Neural Networks
  - Geometric Deep Learning
  - Dynamic Optimization
  - Data Structures
  - Numerical Linear Algebra

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## Experience

### AWS Applied Scientist Intern

May - August 2026

Kiro Science, Amazon

Santa Clara, California

- Designed and shipped a self-improving multi-agent adversarial framework for measuring Agent-as-a-Judge robustness, taxonomized 6 attack-class biases, and demonstrated cross-model judge vulnerability transfer.

### AWS Software Engineering Intern

Jun 2024 - Aug 2024, May 2025 - Aug 2025

API Gateway, Amazon

Denver, Colorado

- Re-architected Private API ingress by removing NGINX proxy layer and implementing direct traffic handling
- Designed and deployed isolation fleet to mitigate large-scale DDoS attacks across 300K+ accounts
- Increased successful API transactions by 30% via dynamic routing and system-level optimization
- Reduced p99 latency from 2000ms → 20ms under adversarial load

### Research Assistant Lead

February 2022 – April 2025

Graph Neural Networks Lab

Provo, Utah

- Led large-scale experimentation training 200+ GNN models in parallel (15M+ data points) using PyTorch
- Invited talk at SIAM-NSS; Accepted paper to SIAM Journal on Applied Mathematics