Kirin P. Danek

kirin@useunix.com 612-481-9784 Kirin2D2.github.io linkedin.com/in/kirindanek

Education

Princeton University, Princeton, NJ *Expected Graduation: May 2026*

- B.S.E. in Computer Science **GPA**: 3.75 — **Departmental:** 3.91
- Minor in Statistics and Machine Learning
- Relevant Coursework: Machine Learning (Course Assistant), Statistics, Data Analysis, Data Structures and Algorithms, Linear Algebra, Multivariable Calculus, Discrete Mathematics, Programming Systems

Danish Institute for Study Abroad, Copenhagen, DK *Expected: Jan 2025 - May 2025*

- Relevant Coursework: Artificial Intelligence, Complex Networks, Analysis of Big Data

Skills

Programming Languages: Java, Python (Pandas, PyTorch, TensorFlow), C/C++, Golang, Rust, R, SQL
Tools: Git/GitHub, Unix/Linux (bash scripting), LaTeX, Stata, VScode, JetBrains platforms, Emacs
Interests: Causal Inference, Missing Data, Machine Learning Theory, Model Compression, Explainable AI, Algorithms, Probability, Statistics

Research

Blocky: Helpful AI Blockchain Assistant, Princeton University, Princeton, NJ *Winter 2024-25*

- Assist professor Pramod Viswanath to create AI teaching assistant for Princeton's ECE470: Principles of Blockchains. Allow students to receive instant expert-level responses to coding and conceptual course queries.
- Curate blockchain-related text dataset + fine-tune LLM, adjust hyperparameters, optimizers, templates adapted from Llama-3 (Python, PyTorch, LLaMA-Factory)
- Demonstrate superior relevance and accuracy for specific blockchain theoretical and practical queries versus existing models (GPT4o, LLaMA-3)

Princeton Vision and Learning Lab, Princeton University, Princeton, NJ *Sep 2024 - January 2025*

- Assist PhD candidate Hongyu Wen in research on Depth Anything depth estimation for non-lambertian objects
- Benchmark trained deep neural networks to test performance on non-lambertian objects (Python)

Author: Proxy Selection in Divergent Data Sets, Princeton University, Princeton, NJ *Jul 2024 - Present*

- Co-author forthcoming data science paper with professor Howard Lavine (UMN)
- Create and develop novel Proxy Finder algorithm. Introduce "correlation reduction" to existing imputation methods to empirically identify a proxy for an essential missing variable.
- Rigorously test performance on synthetic and naturally occurring political science data.
- Eliminate intense human involvement from previous proxy identification methods, allowing political scientists to empirically judge proxy strength, with substantially reduced uncertainty.
- Work accepted at Midwest Political Science Association 2025 conference, intended presentation: April 2025.

Work Experience

ML Undergraduate Course Assistant, Princeton University, Princeton, NJ *Sep - Dec 2024*

- Grade students' written work and programming assignments (Python) for COS324: Introduction to Machine Learning
- Hold weekly office hours to assist students with machine learning and statistics concepts, written work, and programming.

Data Science Research Intern, University of Minnesota, Minneapolis, MN *May - Aug 2024*

- Performed imputation analyses on missing data in survey dataset (Python, Stata); tested low-rank representations; built and fine-tuned neural network (PyTorch) to approximate Bayesian sampling.
- Used clustering analyses to identify and visualize distinct high-dimensional classes of survey respondents, creating empirical cutoffs to meaningfully determine who should be considered "status threatened."
- Project: *Status Threat: The Core of Reactionary Politics*, Drs. Howard Lavine and Christopher Parker

Featured Projects (see GitHub for more)

LoRMA - Low Rank Matrix Approximation algorithm. *Spring 2024*

- Implement algorithmic LoRMA (Python, Pandas) via gradient descent to approximate complex datasets as two low-rank matrices.
- Build and test movie recommendation engine, predicting user ratings from MovieLens dataset. Maintain accurate and meaningful low-rank (40) matrix representations of large dataset (600x10000).

multiClassCnn - Computer vision image classifier. *Spring 2024*

- Use convolutional neural network to build image classifier (Python, PyTorch).
- Trained model achieved 98% test accuracy in classifying images of hand-drawn numbers from the MNIST dataset.

Fraud Detection - ML model for classifying credit card fraud. *Fall 2023*

- Develop a fraud detection model (Java) for Princeton University's COS226.
- Use clustering, decision stumps, and boosting (AdaBoost) to achieve $> 80\%$ test accuracy for detecting fraudulent transactions.
- Model physical space as graph, use graph algorithms for dimensionality reduction of real-world data.