

# Kirin P. Danek

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**Research Interests:** Broadly, I am interested in making Artificial Intelligence (AI) **fair, transparent, and accessible** for interdisciplinary applications and socially impactful domains.

## Education

**Princeton University**, Princeton, NJ  
B.S.E. in Computer Science  
Minor in Statistics and Machine Learning

*Expected: May 2026*  
**GPA:** 3.89 (/4.0)

## Research

### Princeton University

Dec 2024 - Present

*Concept-Aware Neural Network Pruning*

Advisor: Dr. Vikram Ramaswamy

- Create novel framework to compress neural networks by identifying semantically distinct components of a model's decision strategy (concepts), and deleting those which are not relevant to the model's output.
- Achieve up to 13% more accuracy vs SOTA vanilla pruning methods for Convolutional Neural Network on out-of-distribution data, while only sacrificing 1% accuracy on in-distribution data; successfully suppress targeted concept(s) in every test case.
- Prepare paper for submission to XAI4CV workshop at CVPR 2026 conference

### Princeton University

Sep 2025 - Present

*LLM-Powered Instruction Distribution*

Advisor: Dr. Parastoo Abtahi

- Use LLMs to distribute complete instruction sets for team tasks among individual members, reducing cognitive overload.
- Recruit 150 human participants; conduct user studies in group of 3 researchers.
- Improve group task completion times by approx. 25%, coordination times by approx. 70%, without impacting task accuracy.
- Prepare poster + short paper for submission to CHI 2026 conference.

### Princeton University

Apr 2025 - Dec 2025

*Reverse Transfer Learning for Inference in Domain Shift*

Independent Project

- Reverse classic transfer learning pipeline to optimize deep neural networks for predicting across divergent domains.
- Apply to large-N social science datasets and computer vision domain shift datasets.

### University of Minnesota

Jul 2024 - May 2025

*Proxy Selection in Divergent Data Sets*

Advisor: Dr. Howard Lavine

- Designed an ML method to help political science researchers identify proxies for unobserved variables in survey data.
- Achieved average of 5.5% more variance explained by proxy variables selected with ProxyFinder versus current state-of-the-art methods on political science datasets.

### University of Minnesota

Apr 2024 - Aug 2024

*The Core of Reactionary Politics*

Advisor: Dr. Howard Lavine

- Studied and adapted ML + statistical methods to analyze members of American political movements who feel that their socioeconomic status is threatened.

## Conferences & Presentations

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- **Danek K**, Daniels J, Lavine H, and Parker C. ProxyFinder: Methodological Proxy Selection in Divergent Data Sets. Midwest Political Science Association Annual Meeting, Chicago, IL, April 2025. (Paper + Oral)
- **Danek, K**. ProxyFinder: Methodological Proxy Selection in Divergent Data Sets. Princeton Research Day, Virtual, April 2025. (Oral)

## Teaching

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

- COS324: Introduction to Machine Learning.
- Graded approx. 150 students' written work and programming assignments (Python) weekly.
- Held weekly office hours to assist students with concepts, written work, and programming in fields of machine learning, statistics, and probability theory.

## Awards

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- **Best Project Award**, Princeton COS436: Human-Computer Interaction      2025  
*LLM-Powered Instruction Distribution*
- **Project X Award**, Princeton School of Engineering and Applied Science      2025  
*Concept-Aware Neural Network Pruning*
- **Undergraduate Fund for Academic Conferences**, Princeton University      2025  
*Methodological Proxy Selection in Divergent Data Sets*
- **Student-Initiated Internship Program**, Office of Undergraduate Research, Princeton University      2024  
*Methodological Proxy Selection in Divergent Data Sets*

## Professional Associations

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- Midwest Political Science Association
- Association for Computing Machinery - Special Interest Group on Artificial Intelligence