

Patrick Soga

Email: zqe3cg@virginia.edu, Website: <https://ajb117.github.io>

Education

University of Virginia <i>Ph.D. in Computer Science – 3.93/4.0. Advisor: Prof. Jundong Li.</i>	Aug 2023 – Present Charlottesville, VA
University of Notre Dame <i>B.S. Computer Science, B.A. Philosophy – 3.85/4.0, Cum Laude.</i>	Aug 2018 – Jan 2023 Notre Dame, IN

Publications

* indicates equal contribution.

1. Zhenyu Lei, **Patrick Soga**, Yaochen Zhu, Yinhan He, Yushun Dong, and Jundong Li. MolEdit: Knowledge Editing for Multimodal Molecule Language Models. In *WSDM 2026*.
2. **Patrick Soga**, Zhenyu Lei, Yinhan He, Camille Bilodeau, and Jundong Li. Energy-Based Models for Predicting Mutational Effects on Proteins. In *KDD 2025*.
3. **Patrick Soga**, Yushun Dong, Yaochen Zhu, Jundong Li, Tong Zhao, and Neil Shah. VirtualGCN – Enhancing Graph Collaborative Filtering with Virtual Interactions. In *IEEE Big Data 2025*.
4. Yushun Dong, **Patrick Soga**, Yinhan He, Song Wang, and Jundong Li. Graph Neural Networks Are More Than Filters: Revisiting and Benchmarking from A Spectral Perspective. In *ICLR 2025*.
5. **Patrick Soga**, Zhenyu Lei, Camille L. Bilodeau, and Jundong Li. Deep Interactions for Multimodal Molecular Property Prediction. In *PAKDD 2025*.
6. Yinhan He, Zaiyi Zheng, **Patrick Soga**, Yaochen Zhu, Yushun Dong, and Jundong Li. Explaining Graph Neural Networks with Large Language Models: A Counterfactual Perspective on Molecule Graphs. In *EMNLP 2024 (Findings)*.
7. Jennifer J. Schnur*, Angélica Garcia-Martínez*, **Patrick Soga***, Karla Badillo-Urquiola*, et al. SaludConectaMX: Lessons Learned from Deploying a Cooperative Mobile Health System for Pediatric Cancer Care in Mexico. In *CSCW 2024*.
8. **Patrick Soga** and David Chiang. Bridging Graph Position Encodings for Transformers with Weighted Graph-Walking Automata. In *TMLR, 2023*.
9. Steven Krieg, William Burgis, **Patrick Soga**, and Nitesh Chawla. Deep Ensembles for Graphs with Higher-order Dependencies. In *ICLR 2023*.

Work Experience

Lucy Family Institute for Data and Society <i>Software Developer</i>	June 2021 – May 2022 Notre Dame, IN
<ul style="list-style-type: none">• Built web (React) and mobile (Flutter) apps for gathering and managing patient medical information and assessing cancer patient risk for HIMFG, a premier hospital in Mexico City, Mexico.• Currently deployed with >100 users and records. Resulted in [7].	
FloVision Solutions <i>ML & Software Engineer</i>	July 2021 – March 2022 Remote
<ul style="list-style-type: none">• Wrote Google Cloud Function pipelines for automating annotations and deployed inference jobs with Docker on Google Cloud Compute Engine VMs.• Tuned CNN architectures using transfer learning techniques for food image classification for waste reduction.	
Million Marker <i>Software Engineering Intern (part-time)</i>	February 2021 – May 2021 Palo Alto, CA
<ul style="list-style-type: none">• Developed OCR functionality using Google’s Tesseract and Amazon’s Textract for extracting ingredients from product labels.	

RJ Reliance

Software Development Intern

December 2020 – February 2021

Remote

- Wrote Python scripts to generate datasets detailing job requisitions, job applications, and other data pertaining to HR for showcasing core company products.
- Designed, implemented, and deployed a React web frontend and corresponding NodeJS REST API with a MongoDB database on Heroku for showcasing and working with the data.

Research Experience

Snap Collaboration

February 2024 – October 2024

- Developed a novel GCN-inspired matrix factorization method for graph collaborative filtering-based recommendation under supervision of Snap research scientists. Resulted in [3].

Teaching

- TA for CS 6316 Machine Learning, Fall 2025.
- TA for CS 4774 Machine Learning, Spring 2025 and 2026.

Academic Service

- Reviewer for ICML 2025-2026, ICLR 2026, CIKM 2025 Demo Track, WWW 2025, ACML 2024-2025, ICLR 2024 Tiny Papers Track, and TMLR.
- External reviewer for KDD 2024-2025, IJCAI 2024, WSDM 2024, and DSAA 2024.

Skills

Programming & Frameworks: Python, PyTorch, PyTorch Geometric, Deep Graph Library (DGL), RDKit, Biopython, Biotite, C, JavaScript, TypeScript, PostgreSQL, ReactJS, Angular, NodeJS, Flask.

Software & Tools: Git, Ubuntu, SLURM, Google Cloud Platform (Cloud Functions, Compute Engine, Firestore), AWS (S3, Lambda, EC2), AlphaFold.

Awards & Distinctions

- Student Travel Award: KDD 2025, PAKDD 2025
- Phi Beta Kappa, Spring 2023

Miscellaneous

- Citizenship: United States of America
- Languages: English (native), Japanese (basic)