

# Jialu Bao

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## Education

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### Ph.D. student in Computer Science

CORNELL UNIVERSITY

Transferred from UW – Madison with thesis advisor [Justin Hsu](#)

Ithaca, NY

Aug. 2021 – Aug. 2025

### Ph.D. student in Computer Sciences

UNIVERSITY OF WISCONSIN – MADISON

Madison, WI

Aug. 2019 – July 2021

### B.A. in Mathematics and Computer Science

CORNELL UNIVERSITY

Ithaca, NY

*Summa cum laude* in CS, *cum laude* in Mathematics

Jan. 2016 – May 2019

## Positions

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### Postdoctoral Research Associate

NORTHEASTERN UNIVERSITY

Sept. 2025 –

Boston, MA

- Conduct research in probabilistic programming and mentor Ph.D. students under the supervision of Prof. [Steven Holtzen](#).

### Research Intern

BASIS RESEARCH INSTITUTE

May 2024 – Aug. 2024

New York, NY

- Enhanced probabilistic programming language [Pyro](#)'s primitive [plate](#) to automatically managing latent variables.

### Research Engineering Intern

AQR CAPITAL MANAGEMENT

June 2018 – Aug. 2018

Greenwich, CT

- Implemented a model of interests rate swap for backtesting.

## Conference Papers

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### Bluebell: An Alliance of Relational Lifting and Independence For Probabilistic Reasoning

Jialu Bao, Emanuele D'Ousualdo, Azadeh Farzan

*Symposium on Principles of Programming Languages (POPL)*, 2025

URL: <https://arxiv.org/abs/2402.18708>

### A Categorical Approach to DIBI models

Tao Gu, Jialu Bao, Justin Hsu, Alexandra Silva, Fabio Zanasi

*International Conference on Formal Structures for Computation and Deduction (FSCD)*, 2024

URL: <https://arxiv.org/abs/2401.05842>

### Data-Driven Invariant Learning for Probabilistic Programs

Jialu Bao, Nitesh Trivedi, Drashti Pathak, Justin Hsu, Subhajit Roy

*International Conference on Computer Aided Verification (CAV)*, 2022

URL: <https://arxiv.org/abs/2106.05421>

### A separation logic for negative dependence

Jialu Bao, Marco Gaboardi, Justin Hsu, Joseph Tassarotti

*Symposium on Principles of Programming Languages (POPL)*, 2022

URL: <https://arxiv.org/pdf/2111.14917>

### A Bunched Logic for Conditional Independence

Jialu Bao, Simon Docherty, Justin Hsu, Alexandra Silva

*ACM/IEEE Symposium on Logic in Computer Science (LICS)*, 2021

URL: <https://arxiv.org/abs/2008.09231>

### Hidden Community Detection on Two-layer Stochastic Models: a Theoretical Perspective

Jialu Bao, Kun He, Xiaodong Xin, Bart Selman, John E Hopcroft

*International Conference on Theory and Applications of Models of Computation (TAMC)*, 2020

URL: <https://arxiv.org/abs/2001.05919>

## Journal Articles

### Structure Amplification on Multi-layer Stochastic Block Models

Kun He, Xiaodong Xin, Jialu Bao, Meng Wang, Bart Selman, John E Hopcroft

ACM Transactions on Knowledge Discovery from Data (TKDD)

URL: <https://arxiv.org/abs/2108.00127>

### Data-Driven Invariant Learning for Probabilistic Programs

Jialu Bao, Nitesh Trivedi, Drashti Pathak, Justin Hsu, Subhajit Roy

Formal Methods in System Design, 2024

URL: <https://arxiv.org/abs/2106.05421>

## Workshop Publications

### Mixture Languages

Oliver Richardson, Jialu Bao

Languages for Inference (LAFI), 2024

URL: <https://baojia.lu/assets/preprints/mixture.pdf>

## Awards

2023	<b>Honorable Mention</b> , Jane Street Graduate Research Fellowship	New York, NY
2022	<b>Departmental Nominee (&lt; 3%)</b> , Cornell CS's Nomination for Google PhD Fellowship	Ithaca, NY
2022	<b>Distinguished Paper Award (&lt; 0.5%)</b> , Computer Aided Verification (CAV)	Haifa, Israel
2020	<b>Departmental Nominee</b> , UW-Madison's Nomination for Microsoft Ada Lovelace Fellowship	Madison, WI
2019–2020	<b>Departmental Fellowship (&lt; 5%)</b> , Computer Sciences, UW – Madison	Madison, WI

## Teaching Experience

### Graduate Teaching Assistant

Aug. 2021 – May 2022

CORNELL COMPUTING AND INFORMATION SCIENCE

Ithaca, NY

- Designed reading questions and helped students' presentations for [CS 6182: Foundations of Probabilistic Programming \(FA21\)](#).
- Led recitations and guided students' final projects for [CS 3110: Data Structures and Functional Programming \(SP22\)](#).

### Undergraduate Teacher Assistant

Jan. 2017 – May 2019

CORNELL COMPUTING AND INFORMATION SCIENCE

Ithaca, NY

- Taught recitations twice a week, and designed OCaml exercises and a new interpreter assignment for [CS 3110 \(SP19\)](#).
- Held weekly office hours and graded homework for [CS 4820 \(FA18\)](#), [CS 3110 \(SP18\)](#), [CS 2850 \(FA17\)](#), [INFO 2950 \(SP17\)](#).

## Professional Service

Mentor for SIGPLAN-M	Jan. 2025 -
Operations Team of SIGPLAN-M	Nov. 2022 - Aug. 2024
Organizer for Cornell Great Works in PL Seminar	Jan. 2024 - May 2024
Organizer for Cornell PL Discussion Group	June 2022 - May 2024
Reviewer of Cornell CS PhD Applications	Dec. 2022 - Jan. 2023
Mentor for Cornell Applicant Support Program	Oct. 2022 - Nov. 2022
Student Volunteer for CAV 2021	July 2021
Mentor for Wisconsin Science and Computing Emerging Research Stars	Jan. 2021 - May 2021
Student Volunteer for POPL 2021	Jan. 2021
Event Organizer for Cornell's Chapter of ACM	Oct. 2016 – Dec. 2018

## Reviewer

LAFI 2026, LICS 2025, FM 2024, CSF 2024, CONCUR 2022, PLDI Artifact Evaluation