

BENJIE WANG

MEB 2174, 50 S Central Campus Dr #2110, Salt Lake City, UT 84112

<https://web.cs.ucla.edu/~benjiewang> ◇ benjie.wang@utah.edu

EMPLOYMENT

Assistant Professor Kahlert School of Computing, University of Utah	August 2026 - Present <i>Salt Lake City, UT</i>
Postdoctoral Scholar University of California, Los Angeles	January 2024 - July 2026 <i>Los Angeles, CA</i>
Simons-Berkeley Research Fellow Simons Institute for the Theory of Computing, UC Berkeley	August - December 2023 <i>Berkeley, CA</i>

EDUCATION

DPhil (Ph.D.) in Computer Science, University of Oxford Thesis: Tractable Probabilistic Models for Causal Learning and Reasoning Advisor: Marta Kwiatkowska	2019 - 2023
MSc in Statistical Science, University of Oxford Dissertation: Statistically Robust Neural Network Classification Advisor: Tom Rainforth Result: Distinction, 89%; Gutierrez-Toscano Prize (top-ranked in cohort)	2018 - 2019
BA in Mathematics, University of Cambridge Result: First Class Honours, 82%	2015 - 2018

PUBLICATIONS

Peer-Reviewed Journal Publications (* = equal contribution)

1. *PREMAP: A Unifying PREiMage APproximation Framework for Neural Networks*. Xiyue Zhang*, Benjie Wang*, Marta Kwiatkowska, Huan Zhang. *Journal of Machine Learning Research (JMLR)*, 2025.

Peer-Reviewed Conference Publications (* = equal contribution)

17. *Meta-Ctrl: Guaranteed Plan Generation by Decoupling Syntactic and Semantic Constraints*. Gwen Yidou-Weng*, Edward Sun*, Tianyi Ma, Metip Alp Dogan, Benjie Wang, Allen Peng, Guy Van den Broeck, Yuchen Cui. *Conference on Robot Learning (CoRL)*, 2026.

16. *Interpretable Causal Discovery via Causal-Effect Constraints*. Cixuan Zhang, Guy Van den Broeck, Benjie Wang. *42nd Conference on Uncertainty in Artificial Intelligence (UAI)*, 2026.

15. *Breaking the Factorization Barrier in Diffusion Language Models*. Ian Li, Zilei Shao, Benjie Wang, Rose Yu, Guy Van den Broeck, Anji Liu. *43rd International Conference on Machine Learning (ICML)*, 2026.

14. *TRACE Back from the Future: A Probabilistic Reasoning Approach to Controllable Language Generation*. Gwen Yidou-Weng*, Benjie Wang*, Guy Van den Broeck. *42nd International Conference on Machine Learning (ICML)*, 2025.

13. *Scaling Probabilistic Circuits via Monarch Matrices*. Honghua Zhang*, Meihua Dang*, Benjie Wang*, Stefano Ermon, Nanyun Peng, Guy Van den Broeck. *42nd International Conference on Machine Learning (ICML)*, 2025.

12. *Restructuring Tractable Probabilistic Circuits*. Honghua Zhang*, Benjie Wang*, Marcelo Arenas, Guy Van den Broeck. 28th International Conference on Artificial Intelligence and Statistics (AISTATS), 2025. **Oral (2% acceptance)**.
11. *On the Relationship Between Monotone and Squared Probabilistic Circuits*. Benjie Wang, Guy Van den Broeck. 39th AAAI Conference on Artificial Intelligence (AAAI), 2025.
10. *A Compositional Atlas for Algebraic Circuits*. Benjie Wang, Denis Deratani Mauá, Guy Van den Broeck, YooJung Choi. 38th Annual Conference on Neural Information Processing Systems (NeurIPS), 2024.
9. *Where is the signal in tokenization space?* Renato Lui Geh, Honghua Zhang, Kareem Ahmed, Benjie Wang, Guy Van den Broeck. Conference on Empirical Methods in Natural Language Processing (EMNLP), 2024, **Oral (3.2% acceptance)**.
8. *Neural Structure Learning with Stochastic Differential Equations*. Benjie Wang*, Joel Jennings, Wenbo Gong*. Twelfth International Conference on Learning Representations (ICLR), 2024.
7. *Provable Preimage Under-approximation for Neural Networks*. Xiyue Zhang, Benjie Wang, and Marta Kwiatkowska. 30th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), 2024.
6. *Compositional Probabilistic and Causal Inference using Tractable Circuit Models*. Benjie Wang and Marta Kwiatkowska. 26th International Conference on Artificial Intelligence and Statistics (AISTATS), 2023.
5. *Tractable Uncertainty for Structure Learning*. Benjie Wang, Matthew Wicker, Marta Kwiatkowska. 39th International Conference on Machine Learning (ICML), 2022, **Oral (2% acceptance)**.
4. *Robustness Guarantees for Credal Bayesian Networks via Constraint Relaxation over Probabilistic Circuits*. Hjalmar Wijk, Benjie Wang, Marta Kwiatkowska. 31st International Joint Conference on Artificial Intelligence (IJCAI), 2022.
3. *Statistically Robust Neural Network Classification*. Benjie Wang, Stefan Webb, Tom Rainforth. 37th Conference on Uncertainty in Artificial Intelligence (UAI), 2021.
2. *Provable Guarantees on the Robustness of Decision Rules to Causal Interventions*. Benjie Wang*, Clare Lyle*, Marta Kwiatkowska. 30th International Joint Conference on Artificial Intelligence (IJCAI), 2021.
1. *Assessing Robustness of Text Classification through Maximal Safe Radius Computation*. Emanuele La Malfa, Min Wu, Luca Laurenti, Benjie Wang, Anthony Hartshorn, Marta Kwiatkowska. Findings of the Association for Computational Linguistics: EMNLP (EMNLP Findings), 2020.

Peer-Reviewed Workshop Publications and Working Papers

- The Pitfalls of Maximum Likelihood Estimation of TPMs for Controllable Language Generation*. Hanzhang Liu, William Zhao, Zilei Shao, Benjie Wang, Guy Van den Broeck. Workshop on Tractable Probabilistic Modeling (TPM) @ UAI, 2026.
- How to Marginalize in Causal Structure Learning?* William Zhao, Guy Van den Broeck, Benjie Wang. Workshop on Graphs and more Complex Structures For Learning and Reasoning (GCLR) @ AAAI, 2026.
- Conditional Causal Discovery*. Cixuan Zhang, Benjie Wang. Workshop on Causal Abstractions and Representations (CAR) @ UAI, 2025.
- Large Language Models as Tools to Improve Bayesian Causal Discovery*. Bruna Bazaluk, Benjie Wang, Denis Mauá, Flavio S Correa da Silva. Workshop on Causal Abstractions and Representations (CAR) @ UAI, 2025.

Bitblasting for Constrained Decorrelation in Tractable Image Modeling. Poorva Garg, Benjie Wang, Oliver Broadrick, Guy Van den Broeck, Todd Millstein. 8th Workshop on Tractable Probabilistic Modeling (TPM) @ UAI, 2025.

A Circus of Circuits: Connections Between Decision Diagrams, Circuits, and Automata. Antoine Amarilli, Marcelo Arenas, YooJung Choi, Mikael Monet, Guy Van den Broeck, Benjie Wang. Tech Report.

Probabilistic Circuits for Cumulative Distribution Functions. Oliver Broadrick, William Cao, Benjie Wang, Martin Trapp and Guy Van den Broeck. 7th Workshop on Tractable Probabilistic Modeling (TPM) @ UAI, 2024.

Bayesian network models of causal interventions in healthcare decision making: literature review and software evaluation. Artem Velikzhanin, Benjie Wang, Marta Kwiatkowska. Tech Report.

Symbolic Causal Inference via Operations on Probabilistic Circuits. Benjie Wang and Marta Kwiatkowska. Workshop on Neuro Causal and Symbolic AI (nCSI) @ NeurIPS, 2022.

Tractable Uncertainty for Structure Learning. Benjie Wang, Matthew Wicker, Marta Kwiatkowska. 5th Workshop on Tractable Probabilistic Modeling (TPM) @ UAI, 2022, **Best Paper Award**.

TEACHING

Instructor, CS 4300/6300 Artificial Intelligence at KSoC, University of Utah	Fall 2026
Guest Lecturer, CS161 Fundamentals of Artificial Intelligence at CS Dept, UCLA	2024
Class Tutor, Machine Learning at CS Dept, Oxford	2022 - 2023
Class Tutor, Quantum Information at CS Dept, Oxford	2021 - 2022
Class Tutor, Probabilistic Model Checking at CS Dept, Oxford	2021 - 2022
Class Tutor, Information Theory at Mathematical Institute, Oxford	2019 - 2020
Practical Demonstrator, Machine Learning at CS Dept, Oxford	2019 - 2020

AWARDS

Simons-Berkeley Research Fellowship	2023
Research Fellowship associated with program on "Logic and Algorithms in Database Theory and AI".	
Best Paper Award, 5th Workshop on Tractable Probabilistic Modeling @ UAI	2022
Awarded for "a novel tractable distribution over orderings with important applications to scaling causal discovery".	
Gutierrez-Toscano Prize, Department of Statistics, University of Oxford	2019
Awarded for best performance in MSc Statistical Science.	
Durham Prize, Keble College, University of Oxford	2019
Awarded for outstanding performance in Masters degree.	
Honorary Bachelor Scholarship, Emmanuel College, University of Cambridge	2018
Awarded for outstanding performance in Bachelor's degree.	
Braithwaite Batty Senior Scholarship, Emmanuel College, University of Cambridge	2017
Awarded for outstanding performance in Mathematics.	
National Finalist, British Informatics Olympiad	2015
Among top 15 nationally.	

ORGANIZATION AND ACADEMIC SERVICE

Co-organizer of the **7th Workshop on Tractable Probabilistic Modeling (TPM)** at UAI 2024

Journal and Conference Refereeing JMLR, IJAR, ICML (2022, 2023, 2024, 2025 - **Top Reviewer**, 2026), AISTATS (2021, 2023, 2024, 2025), AAAI 2025, NeurIPS (2021 - **Outstanding Reviewer Award**, 2022, 2024, 2025), ICLR 2024.

Volunteering Student Volunteer at UAI 2022; Volunteer Teaching Assistant in local schools (STIMULUS program - Cambridge, UK)

PRESENTATIONS

Bridging the Formalization Gap in Generative AI
UIUC Machine Learning Seminar May 2026

Symbolic Reasoning in the Age of Large Language Models
Amazon AWS October 2025

Probabilistic Reasoning in Large-Scale Models
UCSD Huang Lab July 2025

Restructuring Tractable Probabilistic Circuits
International Conference on Artificial Intelligence and Statistics May 2025
Simons Institute for the Theory of Computing, UC Berkeley Jan 2025

Scaling Up Marginalization in Probabilistic Modeling
NYU Wilson Lab Feb 2025

Tractable Deep Generative Models
National AI Research Resource (NAIRR) Annual Meeting Feb 2025

Marginal Determinism in Structured Decomposable Circuits
Simons Institute for the Theory of Computing, UC Berkeley Oct 2023

Compositional Probabilistic and Causal Inference
Causality Discussion Group May 2023

Tractable Uncertainty for Structure Learning
Aalto University/ELLIS Seminar on Advances in Probabilistic Machine Learning Feb 2023
International Conference on Machine Learning Jul 2022

SUPERVISION AND MENTORING

Cixuan Zhang Undergrad at UCLA → M.S. at Yale University

Ian Li Undergrad at Harvey Mudd College → Ph.D. at UCSD

William Zhao Undergrad at UCLA → M.S. at Stanford University

Sophie Li Undergrad at UCLA

Bruna Bazaluk MSc at University of São Paulo → Ph.D. at TU Delft

Renato Lui Geh Ph.D. at UCLA (mentoring)

Gwen Yidou-Weng Ph.D. at UCLA (mentoring)

Hjalmar Wijk DPhil at Oxford (mentoring) → Researcher, METR