JACQUELINE MAASCH

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Research Focus

Machine intelligence for reasoning and decision-making under uncertainty.

Education

2026 **Cornell Tech | New York, NY**
Doctor of Philosophy in Computer Science (anticipated)

2024 MS in Computer Science, conferred on PhD candidacy | GPA 4.0
Areas: AI / ML, Scientific Computing, Applied Probability & Statistics
NSF Graduate Research Fellow | *Presidential Life Science Fellow*

2021 **University of Pennsylvania | Philadelphia, PA**
Master of Computer & Information Technology | GPA 3.97
Interdisciplinary Innovation Fellow | *Reproducible Research Fellow*

2016 **Smith College | Northampton, MA**
BA Anthropology (Biological, Medical), Environmental Science | GPA 3.97
Summa Cum Laude – Top 1% of class | *Phi Beta Kappa* | *Sigma Xi*

Experience

03.2026 – 05.2026 **Resident, Causal Inference**
Isaac Newton Institute for Mathematical Sciences | *Cambridge, UK*
Invited scholars' residency at the University of Cambridge on the theory and methods of causal inference.

05.2025 – 08.2025 **Research Intern**
YRIKKA | *New York, NY*
PI: Dr. Kia Khezeli. Test-time adaptation and world modeling for abstract, causal, and logical reasoning in large language models.
Outcomes: NeurIPS LAW 2025 (spotlight), Amazon Trusted AI (poster).

05.2024 – 08.2024 **Research Intern**
Microsoft Research (MSR), Machine Intelligence Core | *Cambridge, UK*
PI: Dr. Aditya Nori, Dr. Javier González. Methods for the evaluation and elicitation of causal and compositional reasoning in language models.
Outcomes: ICML 2025, ICLR 2025, pending patent, 2.3k+ HF downloads.

05.2022 – 08.2022 **Clinical Data Science Intern**
Boehringer Ingelheim, Biostatistics & Data Sciences | *Ridgefield, CT*
PI: Dr. Yi Liu. Internal research on multimodal deep learning for survival analysis in pharmaceutical development.

08.2021 – Present **PhD Student Researcher**
Weill Cornell Medicine, Institute of AI for Digital Health | *New York, NY*
PI: Dr. Fei Wang. Causal machine learning for computational biomedicine.

Cornell Tech Computer Science | *New York, NY*
PI: Dr. Volodymyr Kuleshov. Deep generative and probabilistic modeling.

Cornell Tech Operations Research | *New York, NY*
PI: Dr. Kyra Gan. Robust and efficient statistical inference, scalable causal discovery, and causal fairness in healthcare.

05.2020 – 07.2021 **Master's Student Researcher**
University of Pennsylvania Bioengineering | *Philadelphia, PA*
PI: Dr. César de la Fuente. New paradigms for ML-based drug discovery.
Outcomes: Thesis coined the new field of *molecular de-extinction*, published in Cell Host & Microbe and covered by NPR, Nature News, and CNN.

Languages	*Proficient*: Python; R; LaTeX; shell. *Prior experience:* Stan; Java; C; MATLAB.
Frameworks	PyTorch; NumPy; sklearn; tidyverse; Git; AWS; Slurm-based HPC; ARC-AGI.
Skills & Interests	*2019 – Present*: Probabilistic graphical models; generative models; AI reasoning; world models; neuro-symbolic AI; AI evaluation; causal inference; causal discovery; causal fairness; reinforcement learning; graph theory; applied probability; statistics; logic; computational biomedicine; drug discovery. *Pre-2019*: Molecular genetics, molecular diagnostics, epidemiology.

Select Fellowships & Awards

2025	Doctoral Fellowship | Cornell Tech Digital Life Initiative
2023	Outstanding Service and Community Award | Cornell Tech
2021	NSF Graduate Research Fellowship | US National Science Foundation
2021	Presidential Life Science Fellowship | Cornell University
2021	Reproducible Research Fellowship | OKFN, Alfred P. Sloan Foundation
2020	Interdisciplinary Innovation Fellowship | University of Pennsylvania
2020	Grace Hopper Celebration Scholarship | University of Pennsylvania

Select Peer-Reviewed Publications (Google Scholar)

2025 ICML **Maasch, J**; Hüyük, A; Xu, X; Nori A; González J. *Compositional Causal Reasoning Evaluation in Language Models.* 42^{nd} International Conference on Machine Learning. [arxiv] [slides] [website] [poster]

2025 ICLR - ORAL - TOP 1.8% Hüyük, A; Xu, X; **Maasch, J**; et al. *Reasoning Elicitation in Language Models via Counterfactual Feedback.* 13^{th} International Conference on Learning Representations. [arxiv]

2025 AAAI **Maasch, J**; et al. *Local Causal Discovery for Structural Evidence of Direct Discrimination.* 39^{th} Annual AAAI Conference on Artificial Intelligence. [arxiv] [slides] [poster]

2024 NEURIPS Hiremath, S; **Maasch, J**; et al. *Hybrid Top-Down Global Causal Discovery with Local Search for Linear and Nonlinear Additive Noise Models.* 38^{th} Annual Conference on Neural Information Processing Systems. [arxiv]

2024 UAI **Maasch, J**; et al. *Local Discovery by Partitioning: Polynomial-Time Causal Discovery Around Exposure-Outcome Pairs.* 40^{th} Conference on Uncertainty in Artificial Intelligence. [arxiv] [slides] [poster]

2023 CELL HOST & MICROBE **Maasch, J***; Torres, M*; et al. *Molecular de-extinction of ancient antimicrobial peptides enabled by machine learning.* Cell Host & Microbe. 31. 8. 1260-1274. e6. 2023. **Equal contribution.* [cell]

Peer-Reviewed Workshop Presentations

2025 NEURIPS - SPOTLIGHT **Maasch, J**; Kalantari, J; Khezeli, K. *CausalARC: Abstract Reasoning with Causal World Models.* NeurIPS LAW: Bridging Language, Agent, and World Models. [workshop] [arxiv] [website]

2023 NEURIPS **Maasch, J**; et al. *Local Discovery by Partitioning: Polynomial-Time Causal Discovery Around Exposure-Outcome Pairs.* NeurIPS Causal Representation Learning Workshop. [workshop] [arxiv]

2023 ICML **Maasch, J**; et al. *Regularized Data Programming with Automated Bayesian Prior Selection.* ICML Workshop on Structured Probabilistic Inference & Generative Modeling. [workshop] [arxiv]

Under Review & In Preperation

2026 Lawrence, R*; **Maasch, J***. *Position: Beyond Reasoning Zombies — AI Reasoning Requires Process Validity.* Under review. **Equal contribution.*

2025 **Maasch, J**; Neiswanger, W; Kuleshov, V; Ermon, S. *Probabilistic Graphical Models: A Concise Tutorial.* Invited, under review. [arxiv] [website]

Pending Patents

2024 Hüyük, A; Xu, X; **Maasch, J**; Nori A; González J. *Fine-Tuning Language Models for Reasoning with Counterfactual Feedback.* App no: 63/699,777.

Invited Posters

01.26 Amazon AGI Trusted AI Symposium | New York, NY [website]

Invited Talks

07.25	Microsoft Expo Booth, ICML | Vancouver, BC
04.25	Flatiron Institute, Simons Foundation | New York, NY [slides]
03.25	Cornell INFO5375: Machine Learning for Health | New York, NY [slides]
10.24	INFORMS Annual Meeting | Seattle, WA [slides]
07.24	Microsoft Research Machine Intelligence Core | Cambridge, UK
06.24	University of Cambridge Statistical Laboratory | Cambridge, UK
04.24	34th Annual POMS Conference | Minneapolis, MN [slides]

Professional Activities

24-25	Co-organizer, NYC Learning on Graphs Workshop
24-25	PhD Application Reviewer, Cornell Computer Science Graduate Admissions
23-25	Student leader, Cornell CS PhD Visit Days
2023	Co-developer, Cornell CS 6006: Succeeding in the Graduate Environment
2023	Founder / organizer, Cornell Causal Reading Group

Peer Review

AI	ICML; UAI; AISTATS; ACL ARR; ICML SPIGM; NeurIPS WiML.
Bio	Communications Biology (Nature Portfolio); Journal of Biomedical Informatics (Elsevier); Bioinformatics (Oxford Academic); ACS Infectious Diseases.