

# Ethan Weinberger

<https://ethanweinberger.com>

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## Education

- 2019-2025 **Ph.D., Computer Science & Engineering**  
University of Washington, Seattle, WA  
Advisor: Su-In Lee  
Additional committee members: Sara Mostafavi & Chandrakana Nandi
- 2014-2018 **B.S., Computer Science & Mathematics**  
Yale University, New Haven, CT  
Advisor: Yuval Kluger

## Awards & Fellowships

- 2020-2025 **National Science Foundation Graduate Research Fellowship**  
Full support for three years of graduate studies over a five year period (\$159,000).
- 2023 **NeurIPS Top Reviewer Award**  
Free conference registration (\$900) awarded to top 10% of NeurIPS reviewers.
- 2019-2020 **Paul G. Allen School of Computer Science & Engineering First-Year Research Fellowship**  
Full support for first year of graduate studies at the University of Washington (\$64,000).
- 2015 **Richard U. Light Fellowship**  
Support for summer of intensive Chinese language studies at National Taiwan University, Taipei, Taiwan (\$8,000).

## Publications

(\*) symbol denotes equal contribution as co-first or co-senior author.

### PREPRINTS & WORKING PAPERS

- [S1] Ethan Weinberger, Wei Qiu, Wei Tian, Qiurui Zeng, Martin Kim, Can Ergen, Nir Yosef, Joseph Ecker, and Su-In Lee. “A deep generative model of single-cell methylomic data”. Early version ([W3]) presented at *NeurIPS Generative AI for Biology (GenBio) 2023*.
- [S2] Uri Shaham, James Garritano, Yutaro Yamada, Ethan Weinberger, Alex Cloninger, Xiuyuan Cheng, Kelly Stanton, Yuval Kluger. “Defending against adversarial images using basis functions transformations”. [PDF]

## JOURNAL ARTICLES

- [J1] **Ethan Weinberger\***, Chris Lin\*, and Su-In Lee. “Isolating salient variations of interest in single-cell data with contrastiveVI”. In: *Nature Methods*. [\[PDF\]](#) [\[RESEARCH BRIEFING\]](#)
- [J2] Nicasia Beebe-Wang, Safiye Celik, **Ethan Weinberger**, Pascal Sturmfels, Philip L De Jager, Sara Mostafavi, Su-In Lee. “Unified AI framework to uncover deep interrelationships between gene expression and Alzheimer’s disease neuropathologies”. In: *Nature Communications*. [\[PDF\]](#)

## ARTICLES IN HIGHLY SELECTIVE CONFERENCE PROCEEDINGS

- [C1] **Ethan Weinberger**, Ian Covert, and Su-In Lee. “Feature Selection in the Contrastive Analysis Setting”. In: *Advances in Neural Information Processing Systems (NeurIPS) 2023*. [\[PDF\]](#)
- [C2] **Ethan Weinberger**, Nicasia Beebe-Wang, and Su-In Lee. “Moment matching deep contrastive latent variable models”. In: *Artificial Intelligence and Statistics (AISTATS) 2022*. [\[PDF\]](#)
- [C3] **Ethan Weinberger**, Joseph Janizek, and Su-In Lee. “Learning deep attribution priors based on prior knowledge”. In: *Advances in Neural Information Processing Systems (NeurIPS) 2020*. [\[PDF\]](#)

## REFEREED WORKSHOP PAPERS

- [W1] **Ethan Weinberger**, Tal Ashuach\* and Ryan Conrad\*. “Modeling variable guide efficiency in pooled CRISPR screens with ContrastiveVI+”. In: *NeurIPS AI for New Drug Modalities (AIDrugX) 2024*. [\[PDF\]](#)
- [W2] **Ethan Weinberger\***, Patrick Yu\*, and Su-In Lee. “A deep generative model for capturing cell to phenotype relationships”. In: *Machine Learning for Computational Biology (MLCB) 2024*. [\[PDF\]](#)
- [W3] **Ethan Weinberger** and Su-In Lee. “A deep generative model for single-cell methylomic data”. In: *NeurIPS Generative AI for Biology (GenBio) 2023*. [\[PDF\]](#)
- [W4] Wei Qiu, **Ethan Weinberger**, and Su-In Lee. “Isolating structured salient variations in single-cell transcriptomic data with StrastiveVI”. In: *Machine Learning for Computational Biology (MLCB) 2023*.
- [W5] Seo-Yoon Moon, **Ethan Weinberger**, and Su-In Lee. “Towards scalable embedding models for spatial transcriptomics data”. In: *Machine Learning for Computational Biology (MLCB) 2023*.
- [W6] **Ethan Weinberger**, Romain Lopez, Jan-Christian Hütter, and Aviv Regev. “Disentangling shared and group-specific variations in single-cell transcriptomics data with multiGroupVI”. In: *Machine Learning for Computational Biology (MLCB) 2022*. Selected for an oral presentation and publication in the PMLR proceedings. [\[PDF\]](#)
- [W7] **Ethan Weinberger\***, Chris Lin\*, and Su-In Lee. “Isolating salient variations of interest in single-cell transcriptomic data with contrastiveVI”. In: *ICLR Machine Learning for Drug Discovery (MLDD) 2022*. [\[PDF\]](#)

## Talks & Presentations

### INVITED SEMINARS

2024

Insitro, Data Science & Machine Learning seminar

## CONTRIBUTED TALKS

- 2023 Allen School Industry Affiliates Day, Lightning Talk
- 2022 Machine Learning in Computational Biology (MLCB), Oral Presentation
- 2022 Paul G. Allen School of Computer Science and Engineering, Research Colloquium
- 2022 University of Washington Computational Molecular Biology Symposium, Lightning Talk

## Industry Experience

- 2024 INSITRO, *Data Science and Machine Learning Intern*, South San Francisco  
Hosted by Angela Pisco. Designed a deep generative model for exploring Perturb-seq datasets that simultaneously infers perturbed versus escaping cells due to variable guide efficiency ([W1]). Received return offer.
- 2022 GENENTECH RESEARCH AND EARLY DEVELOPMENT, *Machine Learning Intern*, South San Francisco.  
Hosted by Aviv Regev. Designed a deep generative model for isolating variations in scRNA-seq data shared among disjoint groups of cells versus those specific to individual groups ([W6]).
- 2018-2019 BRIDGEWATER ASSOCIATES, *Software Engineer*, Westport, CT  
Worked on scaling up Bridgewater's big-data cloud infrastructure and developed new abstractions to improve the productivity of Bridgewater's machine learning researchers.

## Teaching & Mentoring

### UNDERGRADUATE MENTEES

Seo-Yoon Moon, B.S. student, Seoul National University → Ph.D. student, Carnegie Mellon  
Kyvalya Reddy, B.S. student, University of Washington

### TA EXPERIENCE

- 2021, 2023 COMPUTER SCIENCE AND ENGINEERING 527, *University of Washington*.  
Graduate-level computational biology course. Worked with my research supervisor (Dr. Su-In Lee) to restructure course materials to include the latest advancements in modern machine learning for computational biology. Other responsibilities included providing feedback and direction on class research projects, grading written material, and managing weekly office hours.

## Professional Service

### JOURNAL & CONFERENCE REVIEWING

Annals of Applied Statistics, 2023- (1 paper)

Advances in Neural Information Processing Systems (NeurIPS), 2021, 2022, 2023, 2024

Artificial Intelligence and Statistics (AISTATS), 2022, 2024

International Conference on Machine Learning (ICML), 2023

International Conference on Learning Representations (ICLR), 2021, 2022, 2023, 2024

Machine Learning in Computational Biology (MLCB), 2022, 2024

#### DEPARTMENTAL SERVICE

- 2021-2024 PAUL G. ALLEN SCHOOL OF COMPUTER SCIENCE PH.D VISIT DAYS, *Committee Member*  
Created and managed visit days schedules for prospective computational biology Ph.D students.
- 2020 PAUL G. ALLEN SCHOOL OF COMPUTER SCIENCE PH.D VISIT DAYS, *Student Mentor*  
Mentored a pair of first-year Ph.D. students in the Allen School and provided advice on transitioning to life in graduate school.
- 2021, 2023 PAUL G. ALLEN SCHOOL OF COMPUTER SCIENCE PH.D STUDENT ADMISSIONS, *Application Reader*  
Triaged 30 applications per year for further review for Ph.D. admissions to the Allen School.

#### Press

“Distinctions with a difference: Allen School researchers unveil ContrastiveVI, a deep generative model for gleaning additional insights from single-cell datasets”. In: *Allen School News* (2023).