

### Education

- 2019 – **Stanford University**, *PhD Candidate in Computer Science*  
◦ Advisor: Christopher Ré
- 2015 – 2019 **Princeton University**, *B.S.E in Operations Research and Financial Engineering (ORFE), certificate in Applications of Computing*, GPA: 3.962/4  
◦ Graduated Summa Cum Laude  
◦ Senior Thesis: *A Quantum Version of the Multiplicative Weights Algorithm* (recipient of the Ahmet S. Çakmak Thesis Prize)  
◦ Thesis advisor: Elad Hazan

### Research Interests

I'm interested in studying and improving the fundamentals of modern machine learning through data (often known as data-centric AI). On the model training side, I work on data mixing, synthetic data, data representations, and data labeling. On the inference side, I work on test-time algorithms to produce higher-quality model generations, such as ensembling and routing. Currently, I am thinking about how to develop and operationalize a more principled understanding of how models learn from data.

### Publications

- [19] **Aioli: A Unified Optimization Framework for Language Model Data Mixing.**  
Mayee F. Chen\*, Michael Y. Hu\*, Nicholas Lourie, Kyunghyun Cho, Christopher Ré.  
*International Conference on Learning Representations (ICLR)*, 2025.
- [18] **Archon: An Architecture Search Framework for Inference-Time Techniques.**  
Jon Saad-Falcon, Adrian Gamarra Lafuente, Shlok Natarajan, Nahum Maru, Hristo Todorov, Etash Kumar Guha, E. Kelly Buchanan, Mayee F. Chen, Neel Guha, Christopher Ré, Azalia Mirhoseini.  
*In submission*, 2024.
- [17] **Smoothie: Label Free Language Model Routing.**  
Neel Guha\*, Mayee F. Chen\*, Trevor Chow, Ishan S. Khare, Christopher Ré.  
*Conference on Neural Information Processing Systems (NeurIPS)*, 2024.
- [16] **DataComp-LM: In search of the next generation of training sets for language models.**  
Jeffrey Li, . . . , Ludwig Schmidt, Vaishaal Shankar (59 authors including Mayee F. Chen).  
*Conference on Neural Information Processing Systems (NeurIPS) Datasets and Benchmarks Track*, 2024.
- [15] **Cookbook: A framework for improving LLM generative abilities via programmatic data generating templates.**  
Avanika Narayan\*, Mayee F. Chen\*, Kush Bhatia, and Christopher Ré.  
*Conference on Language Modeling (COLM)*, 2024.
- [14] **Skill-it! A Data-Driven Skills Framework for Understanding and Training Language Models.**  
Mayee F. Chen, Nicholas Roberts, Kush Bhatia, Jue Wang, Ce Zhang, Frederic Sala, and Christopher Ré.  
*Conference on Neural Information Processing Systems (NeurIPS)*, 2023. **Spotlight (top 3.1% of submissions).**
- [13] **Embroid: Unsupervised Prediction Smoothing can Improve Few-Shot Classification.**  
Neel Guha\*, Mayee F. Chen\*, Kush Bhatia, Azalia Mirhoseini, Frederic Sala, and Christopher Ré.  
*Conference on Neural Information Processing Systems (NeurIPS)*, 2023.
- [12] **A Case for Reframing Automated Medical Image Classification as Segmentation.**  
Sarah M. Hooper, Mayee F. Chen, Khaled Saab, Kush Bhatia, Curtis Langlotz, and Christopher Ré.  
*Conference on Neural Information Processing Systems (NeurIPS)*, 2023.
- [11] **Anomaly Detection with Multiple Reference Datasets in High Energy Physics.**  
Mayee F. Chen, Benjamin Nachman, and Frederic Sala.  
*Journal of High Energy Physics*, 2023.

- [10] **Ask Me Anything: A Simple Strategy for Prompting Language Models.**  
Simran Arora\*, Avanika Narayan\*, Mayee F. Chen, Laurel Orr, Neel Guha, Kush Bhatia, Ines Chami, Frederic Sala, and Christopher Ré.  
*International Conference on Learning Representations (ICLR)*, 2023. [Notable 25% of acceptances.](#)
- [9] **Reducing Reliance on Spurious Features in Medical Image Classification with Spatial Specificity.**  
Khaled Saab, Sarah M. Hooper, Mayee F. Chen, Michael Zhang, Daniel Rubin, and Christopher Ré.  
*Machine Learning for Healthcare (MLHC)*, 2022.
- [8] **Shoring Up the Foundations: Fusing Model Embeddings and Weak Supervision.**  
Mayee F. Chen\*, Daniel Y. Fu\*, Dyah Adila, Michael Zhang, Frederic Sala, and Christopher Ré.  
*Uncertainty in Artificial Intelligence (UAI)*, 2022. [Best Student Paper Runner-Up Award, Oral Presentation.](#)
- [7] **Perfectly Balanced: Improving Transfer and Robustness of Supervised Contrastive Learning.**  
Mayee F. Chen\*, Daniel Y. Fu\*, Avanika Narayan, Michael Zhang, Zhao Song, Kayvon Fatahalian, and Christopher Ré.  
*International Conference on Machine Learning (ICML)*, 2022.
- [6] **TABi: Type-Aware Bi-Encoders for Open-Domain Entity Retrieval.**  
Megan Leszczynski, Daniel Y. Fu, Mayee F. Chen, and Christopher Ré.  
*Findings of the Association for Computational Linguistics*, 2022.
- [5] **The Details Matter: Preventing Class Collapse in Supervised Contrastive Learning.**  
Mayee F. Chen\*, Daniel Y. Fu\*, Michael Zhang, Kayvon Fatahalian, and Christopher Ré.  
*AAAI Workshop on Artificial Intelligence with Biased or Scarce Data*, 2022. [Best Paper Award.](#)
- [4] **An Adversarial Model of Network Disruption: Maximizing Disagreement and Polarization in Social Networks.**  
Mayee F. Chen and Miklos Z. Racz.  
*IEEE Transactions on Network Science and Engineering (TNSE)*, 2021.
- [3] **Mandoline: Model Evaluation under Distribution Shift.**  
Mayee F. Chen\*, Karan Goel\*, Nimit Sohoni\*, Fait Poms, Kayvon Fatahalian, and Christopher Ré.  
*ICML*, 2021.
- [2] **Comparing the Value of Labeled and Unlabeled Data in Method-of-Moments Latent Variable Estimation.**  
Mayee F. Chen\*, Benjamin Cohen-Wang\*, Steve Mussmann, Frederic Sala, and Christopher Ré.  
*AISTATS*, 2021.
- [1] **Fast and Three-rious: Speeding Up Weak Supervision with Triplet Methods.**  
Mayee F. Chen\*, Daniel Y. Fu\*, Frederic Sala, Sarah M. Hooper, Kayvon Fatahalian, and Christopher Ré.  
*International Conference on Machine Learning (ICML)*, 2020

## Awards and Honors

- 2023 Microsoft Accelerate Foundation Models Research Grant
- 2021 NSF GRFP Honorable Mention
- 2019 Ahmet S. Çakmak Prize, *Princeton University*, awarded for innovative research and an exceptional senior thesis.
- 2018 Phi Beta Kappa, *Princeton University*, one of 28 early inductees.
- 2017 Tau Beta Pi Engineering Honor Society, *Princeton University*
- 2017 Shapiro Prize for Academic Excellence, *Princeton University*, awarded to 2-3% of the class for exceptional academic record.

## Work and Teaching Experience

- 06/23 – **Research Intern**, *Microsoft*, Redmond, WA, Office of Applied Research
  - 09/23 ○ Research on multi-objective prompt optimization.
- 01/23 – **Course Assistant**, *Stanford University*
  - 04/23 ○ CS228: Probabilistic Graphical Models

2016 – 19 **Grader for Computer Science Department, Princeton University**

- COS226: Algorithms and Data Structures (lead grader), COS326: Functional Programming, COS340: Reasoning about Computation, COS324: Introduction to Machine Learning, and COS445: Economics and Computing

06/18–08/18 **Quantitative Trading Intern, IMC Trading, Chicago, IL, Fixed Income, Currencies, and Commodities Desk**

05/17–08/17 **Software Engineering Intern, Google, Mountain View, CA, Advertiser Platform Team**  
Worked on AdWords Next Overviews, frontpage data analytics for ads campaigns

05/16–08/16 **Engineering Practicum Intern, Google, Mountain View, CA, Cloud/Cluster/Kernel team**  
Worked on an infrastructure tool for pushing configuration and data updates to services within Google

## Talks

Jan 30, 2025 Morgan Stanley Research Machine Learning Seminar  
Dec 5, 2024 DatologyAI  
Dec 4, 2024 UChicago ChiData Lab  
Oct 31, 2024 New York University Computational Linguistics and Cognitive Science Seminar  
Oct 24, 2024 Salesforce AI Research FutureForum  
Oct 11, 2023 Stanford Social and Language Technologies Lab  
Aug 31, 2023 Allen Institute for AI  
April 2, 2023 Stanford Generative AI and Foundation Models Workshop  
Dec 5, 2022 NeurIPS Tutorial on Theory and Practice of Dataset Construction, Panelist  
April 30, 2022 Stanford-Berkeley Women in CS/EE Research Meetup  
April 8, 2022 Snorkel AI Machine Learning Whiteboard Talk  
Aug 5, 2021 Stanford MedAI Talk Series  
June 8, 2021 DAWN Research Workshop  
Nov 6, 2020 Google x Stanford Summit

## Coursework

Relevant graduate courses:

- Information Theoretic Lower Bounds in Data Science, Convex Optimization II, Randomized Algorithms

Relevant undergraduate courses:

- *ORFE Courses*: Probability Theory (graduate-level course), Optimization, High Frequency Trading, Decision Modeling for Business Analytics, Monte Carlo Simulation, Strategy and Information, Financial Mathematics, Analysis of Big Data, Probability and Stochastics, Microeconomic Theory, Statistics
- *Computer Science Courses*: Optimization for Machine Learning (graduate-level seminar), Computer Networks, Operating Systems, Economics and Computing, Introduction to Machine Learning, Information Security, Human-Computer Interfaces, Neural Networks, Functional Programming, Reasoning About Computation, Programming Systems, Algorithms and Data Structures

## Service

### Reviewing

I have served as **reviewer** for the following conferences:

- ICML (2021-2025)
- NeurIPS (2021-2024), NeurIPS Datasets and Benchmarks (2024)
- ICLR (2024-2025)
- AISTATS (2023)
- UAI (2020, 2023-2024)
- KDD (2020)

the following workshops:

- ICML Machine Learning for Data: Automated Creation, Privacy and Bias (2021)
- NeurIPS Interpolate: First Workshop on Interpolation Regularizers and Beyond (2022)
- Mathematical and Empirical Understanding of Foundation Models (ICLR 2023-24)
- Efficient Systems for Foundation Models (ICML 2023-2024)
- Data-Centric Machine Learning Research (ICML 2023-2024, ICLR 2024)
- Navigating and Addressing Data Problems for Foundation Models (ICLR 2024)

and the following journals:

- Journal of Data-Centric Machine Learning Research

## Activities

At Stanford University:

- Computer Science PhD Admissions Committee (2020-2023)
- CS Student Applicant Support Program (Mentor 2020-2022, Organizer 2023-2024)
- WiML (Women in Machine Learning) PhD Application Mentorship Program (2022)
- Graduate WiCS (Women in Computer Science) Mentor (2021-2022)
- CS Undergraduate Mentorship Program (2021-2022)
- XTRM Kpop Cover Group: dance captain (2019–), Alliance Dance Team (2019–2021, 2023–)

Other:

- WiML PhD Application Mentorship Program (2022)
- Organizer for Data-Centric Machine Learning Research Workshop (ICLR 2024)