

### 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 am interested in using a theoretical lens to improve modern machine learning techniques from the perspective of data. Recently, I have been focusing on problems in data selection, data labeling, and data representations. Moving forward, I am particularly excited about developing a more principled understanding of how models learn from data.

### Publications

- **Smoothie: Label Free Language Model Routing.**  
Neel Guha\*, Mayee F. Chen\*, Trevor Chow, Ishan S. Khare, Christopher Ré.  
*In submission*, 2024.
- **Cookbook: A framework for improving LLM generative abilities via programmatic data generating templates.**  
Avanika Narayan\*, Mayee F. Chen\*, Kush Bhatia, and Christopher Ré.  
*In submission*, 2024.
- **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).**
- **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.
- **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.
- **Anomaly Detection with Multiple Reference Datasets in High Energy Physics**  
Mayee F. Chen, Benjamin Nachman, and Frederic Sala.  
*Journal of High Energy Physics*, 2023.
- **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.**
- **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.
- **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.**
- **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.

- **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.
- **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.**
- **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.
- **Mandoline: Model Evaluation under Distribution Shift**  
Mayee F. Chen\*, Karan Goel\*, Nimit Sohoni\*, Fait Poms, Kayvon Fatahalian, and Christopher Ré.  
*ICML*, 2021.
- **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.
- **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

- Oct. 11, 2023 Stanford Social and Language Technologies Lab, "Skill-it! A Data-Driven Skills Framework for Understanding and Training Language Models"
- Aug. 31, 2023 Allen Institute for AI, "Skill-it! A Data-Driven Skills Framework for Understanding and Training Language Models"

- April 2, 2023 Stanford Generative AI and Foundation Models Workshop, "Embroid: Correcting Large Language Models with Auxiliary Embeddings"
- Dec. 5, 2022 NeurIPS Tutorial on Theory and Practice of Dataset Construction, Panelist
- April 30, 2022 Stanford-Berkeley Women in CS/EE Research Meetup, "Improving Transfer and Robustness of Supervised Contrastive Learning"
- April 8, 2022 Snorkel AI Machine Learning Whiteboard Talk, "Liger: Fusing Weak Supervision with Foundation Model Embeddings"
- Aug. 5, 2021 Stanford MedAI Talk Series, "Correcting Distribution Shift in the ML Model Evaluation Process"
- June 8, 2021 DAWN Research Workshop, "Mandoline: Model Evaluation under Distribution Shift"
- Nov. 6, 2020 Google x Stanford Summit, "Labeled vs Unlabeled data in Latent Variable Graphical Models"

## 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 (2021-2024)
- NeurIPS (2021-2024), NeurIPS Datasets and Benchmarks (2024)
- ICLR (2024)
- 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)
- 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)