Gary Cheng

chenggar@stanford.edu
www.garycheng.me

Interests

My research interests are broadly in developing provably-better machine learning methods for real world applications. I have recently become interested in applying machine learning towards modernizing the energy grid.

Education

Ph.D. Electrical Engineering, Stanford University

September 2019 - Present GPA 4.0

Advised by Professor John Duchi and supported by the *Professor Michael J. Flynn Stanford Graduate Fellowship.*

B.A. Computer Science, University of California, Berkeley

Highest Distinction (Summa Cum Laude) GPA 4.0

August 2015 - May 2019

Advised by Professors Laurent El Ghaoui, Jean Walrand, and Kannan Ramchandran.

Experience

Stanford Machine Learning Group, *Research Assistant*

June 2020 - Present

Advised by Professor John Duchi, studying problems in causal inference, optimization, differential privacy, and federated learning.

Max Planck Institute for Intelligent Systems, *Research Intern*

May 2022 - August 2022

Worked with Professor Moritz Hardt on a problem at the intersection of causal inference and control, with applications to recommendation systems and digital ad platforms.

Google Research, *Research Intern*

June 2021 - September 2021

Worked with Keith Rush, Zachary Garrett, and Zachary Charles on the Federated Learning Research team to design federated learning methods of training larger models. Paper accepted to CVPR FedVision 2022 workshop and open-sourced software.

UC Berkeley EECS, *Undergraduate Research Assistant*

August 2016 - May 2019

Worked with Professors Laurent El Ghaoui and Kannan on a dataset summarization problem.
Worked with Professor Jean Walrand on a hospital appointment scheduling problem.

Amazon.com, *Software Engineer Intern*

May 2017 - August 2017

Full stack developer on the Forecasting team in Supply Chain Optimization. Implemented graph algorithms to give insight into runtime bottlenecks in forecasting calculations. Created new Java APIs and integrated them into a Ruby on Rails front-end.

Preprints

Gary Cheng, Moritz Hardt, and Celestine Mendler-Dünner. "Causal Inference out of Control: The Steerability of Consumption" Oral Presentation at *A Causal View on Dynamical Systems Workshop at NeurIPS 2022*. https://openreview.net/pdf?id=TixvJOrcE5

Gary Cheng*, Chen Cheng*, and John Duchi. "Collaboratively Learning Linear Models with Structured Missing Data" *in submission*.

Publications

Gary Cheng*, Karan Chadha*, and John Duchi. "Federated Asymptotics: a model to compare federated learning algorithms" Poster at *AISTATS 2023*. https://arxiv.org/abs/2108.07313

Gary Cheng*, Hilal Asi*, Karan Chadha*, and John Duchi. "Private optimization in the interpolation regime: faster rates and hardness results" Spotlight Presentation at *ICML 2022*. https://proceedings.mlr.press/v162/asi22a/asi22a.pdf

Gary Cheng*, Karan Chadha*, and John Duchi. "Accelerated, Optimal, and Parallel: Some Results on Model-Based Stochastic Optimization" Spotlight Presentation at *ICML 2022*. https://arxiv.org/abs/2101.02696

Tavor Baharav, **Gary Cheng**, Mert Pilanci, David Tse. "Approximate Function Evaluation via Multi-Armed Bandits" Poster at *AISTATS 2022*. https://arxiv.org/abs/2203.10124

Gary Cheng*, Hilal Asi*, Karan Chadha*, and John Duchi. "Minibatch Stochastic Approximate Proximal Point Methods" **Spotlight Presentation** at *NeurIPS 2020*. https://papers.nips.cc/paper/2020/hash/fa2246fa0fdf0d3e270c86767b77ba1b-Abstract.html

Gary Cheng, Kabir Chandrasekher, and Jean Walrand. "Static and Dynamic Appointment Scheduling with Stochastic Gradient Descent." In *American Control Conference 2019*. https://ieeexplore.ieee.org/document/8814666

Workshops

Gary Cheng and John Duchi. "Adastar: A Method for Adapting to Interpolation" Poster at OPT2022 Workshop at *NeurIPS 2022*. https://opt-ml.org/papers/2022/paper53.pdf

Gary Cheng, Zachary Charles, Zachary Garrett, and Keith Rush. "Does Federated Dropout actually work?" Oral presentation at *FedVision Workshop at CVPR 2022*. https://bit.ly/3AxCZMk

Gary Cheng, Armin Askari, Kannan Ramchandran, and Laurent El Ghaoui. "Greedy Frank-Wolfe Algorithm for Exemplar Selection." Poster at *BayLearn 2018*. https://arxiv.org/abs/1811.02702

* denotes equal contribution

Teaching

Teaching Assistant, University of California, Berkeley

EE 126, Probability and Random Processes. Spring 2018 & Spring 2019.
CS 170, Algorithms. Fall 2017.
CS 61B, Data Structures and Algorithms. Spring 2017.

Awards

Prof. Michael J. Flynn Stanford Graduate Research Fellowship. Spring 2019, Awarded by Stanford.

NSF Graduate Research Fellowship Honorable Mention. Spring 2019, Awarded by NSF.

UC Berkeley Campus Outstanding GSI Award. Spring 2019, Awarded by UC Berkeley.

GCURS 2017 Outstanding Presentation Award. Fall 2017, Awarded by Rice University.

Cal Alumni Association Leadership Award. Fall 2015, Awarded by UC Berkeley.

Skills

Proficient in: Python
Familiar with: PyTorch, TensorFlow, TensorFlow Federated, Java

Hobbies

Pickleball, Snowboarding, Cycling, Basketball, Watching (most) sports