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**Interests:** Differential Privacy, Stochastic Optimization, Federated Learning, Statistics

## EDUCATION

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### Stanford University

2019–Present

Ph.D. in Electrical Engineering, GPA: 4.00/4.00

Advised by [Prof. John Duchi](#)

### Indian Institute of Technology Bombay

2014–2019

Dual Degree (B.Tech. + M.Tech.) in Electrical Engineering, GPA: 9.68/10

Advised by [Prof. Ankur Kulkarni](#), [Prof. Jayakrishnan Nair](#) and [Prof. Vivek Borkar](#)

Worked on topics in game theory, reinforcement learning and fairness in battery sharing.

## PUBLICATIONS

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- **Private optimization in the interpolation regime: faster rates and hardness results** [Paper](#)  
[K. Chadha\\*](#), [H. Asi\\*](#), [G. Cheng\\*](#), and [J. C. Duchi](#), *ICML 22 (Spotlight)*
- **Federated Asymptotics: A model for evaluating federated learning algorithms** [Paper](#)  
[K. Chadha\\*](#), [G. Cheng\\*](#), and [J. C. Duchi](#), *arXiv:2108.07313, 2021*
- **Accelerated, optimal, and parallel: Some results on model-based stochastic optimization** [Paper](#)  
[K. Chadha\\*](#), [G. Cheng\\*](#), and [J. C. Duchi](#), *ICML 22*
- **Minibatch stochastic approximate proximal point methods** [Paper](#)  
[K. Chadha\\*](#), [H. Asi\\*](#), [G. Cheng\\*](#), and [J. C. Duchi](#), *Neurips 2020 (Spotlight)*
- **Efficiency fairness tradeoff in battery sharing** [Paper](#)  
[K. Chadha](#), [A. A. Kulkarni](#) and [J. Nair](#), *Operations Research Letters, 2021*
- **Aggregate play and welfare in strategic interactions on networks** [Paper](#)  
[K. Chadha](#) and [A. A. Kulkarni](#), *Journal of Mathematical Economics, 2020*
- **On independent cliques and linear complementarity problems** [Paper](#)  
[K. Chadha](#) and [A. A. Kulkarni](#), *IJPAM, 2022*
- **A reinforcement learning algorithm for restless bandits** [Paper](#)  
[V.S. Borkar](#) and [K. Chadha](#), *Indian Control Conference, 2018*

\* denotes equal contribution

## EXPERIENCE

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### Machine Learning Intern, Apple

Summer 2021

Worked with [Omid Javidi](#), [Audra McMillan](#), [Vitaly Feldman](#) and [Kunal Talwar](#) on the problem of estimating histograms in the unknown dictionary setting with local differential privacy. Benchmarked prefix-tree based algorithms on the Reddit dataset to better understand the effect of various hyperparameters and illustrate the benefits of interactivity. Worked with stakeholders to better understand the use-cases, objectives and constraints for using histogram estimation algorithms in practice. Workshop paper in progress

### Research Assistant, Stanford Machine Learning Group

Fall 2019 - Present

Advised by [Prof. John Duchi](#), working on a broad set of problems in statistics, optimization and differential privacy. Currently exploring the impact user heterogeneity creates on both the assumptions and objectives of histogram estimation and various machine learning problems.

## Summer Research Assistant, University of Southern California

Summer 2017

Worked with *Prof. Rahul Jain* to formulate and solve the problem of risk aware economic dispatch – the optimal power each source should pump into a grid in the presence of renewables and random demand to minimize a risk measure of the cost of generation. Also, worked on finding an incentive compatible pricing strategy to ensure sources behave optimally.

## Summer Research Assistant, SYSU-CMU Joint Research Institute

Summer 2016

Worked with *Prof. Paul Weng* on Deep Reinforcement Learning for Atari agents. We studied the trade-off between accuracy and memory costs of training a neural network to learn playing Atari games using binarized neural networks.

## ONGOING PROJECTS

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### Private Confidence Sets via subsampled Bootstraps

We give differentially private algorithms for estimating coverage probabilities and computing valid confidence sets, and prove upper bounds on the error of our estimates and the length of our confidence sets. Our bounds apply to broad classes of data distributions and statistics of interest, and for fixed  $\epsilon$  we match the higher-order asymptotic accuracy of the standard (non-private) non-parametric bootstrap.

## SCHOLARSHIPS AND AWARDS

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- NVIDIA-TSMC Graduate Fellowship, Stanford University 2019
- Sharad Maloo Gold Medal (for outstanding academic and extra-curricular achievements) 2019
- Bhavesh Gandhi Memorial Prize (for standing 1st in the Communications specialization) 2019
- Honda YES Award 2016
- Institute Academic Prize 2017, 2018

## SKILLS & COURSES

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- **Courses:** Asymptotic Statistics, Information Theory and Statistics, Convex Optimization
- **Programming Languages & Frameworks:** Python, Numpy, Pytorch

## ACADEMIC SERVICE

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- Reviewer for NeurIPS, ICLR, AISTATS, ICML
- Organizer, ML Lunch, Stanford, Fall 2020
- Organizer, Workshop on Games and Networks, IIT Bombay, 2019

## REFERENCES

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**Prof. John Duchi**  
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Stanford University  
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**Prof. Vivek Borkar**  
Electrical Engineering  
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