KARAN SINGH

PERSONAL INFORMATION

Princeton University
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RESEARCH INTERESTS

Theoretical and applied Machine Learning, with a focus on Interactive Systems.
Reinforcement Learning, Generative Models, Online Learning.
Privacy and Fairness in Machine Learning.

EDUCATION

2015-Present   Princeton University

PhD Candidate in Computer Science

GPA: 4.0 · *PhD Candidate* · Computer Science
My research is focussed on algorithms for machine learning with provable guarantees on computational and statistical efficiency, with an attentive emphasis on **Interactive Learning Algorithms**. Recent efforts have yielded rigorous methods for learning **Linear Dynamical Systems**, and algorithms for **Reinforcement Learning** with improved generalization performance.
Advisor: Prof. Elad HAZAN

2011-2015   Indian Institute of Technology, Kanpur

Bachelor of Technology, Computer Science

Ranked 1ˢᵗ (among 820 students)

GPA: 10.0 · *Bachelor of Technology* · Computer Science
Following a rigorous introduction to computer systems and engineering, my coursework included 12 graduate-level courses on theoretical computer science, machine learning, and mathematics. My senior thesis details sketch-based algorithms for machine learning, and lower bounds in the streaming model.

Awarded the **President's Gold Medal** for the best academic performance in the graduating class among all disciplines.

PUBLICATIONS ($\alpha\beta$ ORDER)

NIPS 2017 Spotlight

Elad Hazan, **Karan Singh** and Cyril Zhang. Online Learning of Linear Dynamical Systems. In the *Advances in Neural Information Processing Systems 30 (NIPS), 2017*.

ICML 2017

Naman Agarwal and **Karan Singh**. The Price of Differential Privacy for Online Learning. In the *Proceedings of the 34th International Conference on Machine Learning (ICML), 2017*. PDF

ICML 2017

Elad Hazan, **Karan Singh** and Cyril Zhang. Efficient Regret Minimization in Non-Convex Games. In the *Proceedings of the 34th International Conference on Machine Learning (ICML), 2017*. PDF

DEML Workshop, ICML 2016

Irineo Cabreros, **Karan Singh** and Angela Zhou. A Mixture Model for Crowdsourcing. A preliminary version appeared at the *ICML Workshop on Data Efficient Machine Learning, 2016*.

EXPERIENCE

Summer 2014   Research Intern, MICROSOFT RESEARCH, REDMOND

Microsoft Research Redmond

Developed a Programming-by-Natural-Language framework to synthesize programs in targeted domain-specific languages given intents expressed as natural language prompts. The system supported multiple rounds of end-user interactions making it more robust than traditional NLP approaches. Concrete instantiations of the framework offer an interactive experience for repetitive data manipulation and summarization tasks.
Host: Dr. Sumit GULWANI