

Raphael A. Meyer

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Third Year Ph.D. Student Theoretical Computer Science

Education

New York University **Brooklyn, NY**
Ph.D. in Computer Science, 3.92 / 4.00 GPA *2019–Present*
Advised by Prof. Christopher Musco
Deborah Rosenthal, MD Award for Best Qualls Examination:
Towards Optimal Spectral Sum Estimation in the Matrix-Vector Oracle Model

Purdue University **West Lafayette, IN**
B.S. in Computer Science Honors, 3.72 / 4.00 GPA *2015–2020*
Concentrations in Foundations of CS, Computational Science, Machine Intelligence
Minors in Math, Electrical Engineering
Completed 15 Graduate Courses

Research Interests

I research the interplay of Statistics and Computation, largely through the lens of Linear Algebra.

- ▶ Randomized Linear Algebra (RandNLA)
- ▶ Foundations of Data Science
- ▶ Statistical & Computational Lower Bounds
- ▶ Optimization & Machine Learning

Work Experience

Teaching Assistant.....

Algorithmic Machine Learning and Data Science **Brooklyn, NY**
New York University *Fall 2020*

Introduction to Machine Learning **Brooklyn, NY**
New York University *Spring 2020*

Introduction to Algorithmic Analysis **West Lafayette, IN**
Purdue University *Fall 2018*

Undergraduate Research Assistant.....

Theoretical Machine Learning **West Lafayette, IN**
Purdue University *2018-2019*

Information-Theoretic Cryptography **West Lafayette, IN**
Purdue University *2016-2018*

Internships.....

Software Engineering Intern **New York, NY**
Bloomberg L.P. *Summer 2017*

- Recognized, Tested, and Proved Inefficiencies with Existing Distributed Scheduler
- Integrated New Service to Observe System Load and be able to Learn Smart Solutions
- Cleared Technical Debt by Resolving bugs, Collecting Metrics, Automating Workflows

Software Engineering Intern

New York, NY

Bloomberg L.P.

Summer 2016

- Integrated various Database, PubSub, and API platforms to provide a new format of data
- Iteratively designed to guarantee the API we produce matches Client Expectations
- Learned to code Effective, Maintainable, and Production-Worthy code

Service

Organizer: NYU Tandon TCS “Pandemic Presentations” Day (link)	2022
Organizer: NYU Tandon TCS Reading Group	2021
NeurIPS Conference: Conference Reviewer	2022
ICML Conference: Conference Reviewer	2022
STOC Conference: Conference External Reviewer	2022
ICLR Conference: Conference Reviewer	2022
NeurIPS Conference: Conference Reviewer	2021
ISIT Conference: Conference External Reviewer	2017

Honors and Awards

Deborah Rosenthal, MD Award for Best Qualls Exam: New York University	2021
Outstanding Reviewer Award: NeurIPS Conference	2021
Student Travel Grant: ICML Conference	2019
School of Engineering Fellowship: New York University	2019
Finalist: CRA Outstanding Undergraduate Research Award	2018
Student Travel Grant: ISIT Conference	2017
Outstanding Sophomore of the Year: Purdue Computer Science	2016–2017
Silver Medal, Giant Slalom: Ecole de Ski Français	2016
Qualcomm Rookie Team of the Year: Boilermake Hackathon	2015
Top Ten Hacks: Boilermake Hackathon	2015
Certificate of Cuisine: Cordon Blue School of Gourmet Cuisine	2015

Publications

- ▶ **Cheybshev Sampling is Universal for Lp Polynomial Regression**
with Cameron Musco, Christopher Musco, David P. Woodruff, and Samson Zhou *in Submission*.
- ▶ **Fast Regression for Structured Inputs**
with Cameron Musco, Christopher Musco, David P. Woodruff, and Samson Zhou *ICLR 2022*.
- ▶ **Hutch++: Optimal Stochastic Trace Estimation**
with Cameron Musco, Christopher Musco, and David P. Woodruff at *SOSA 2021*.

My most cited article! ([link](#))

- ▶ **The Statistical Cost of Robust Kernel Hyperparameter Tuning**
with Christopher Musco at *NeurIPS 2020*.
- ▶ **Optimality Implies Kernel Sum Classifiers are Statistically Efficient**
with Jean Honorio at *ICML 2019*.
- ▶ **Characterizing Optimal Security and Round-Complexity for Secure OR Evaluation**
with Amisha Jhanji and Hemanta K. Maji at *ISIT 2017*.

Talks & Presentations

Invited Talks.....

Hutch++ and More: Towards Optimal Spectral Sum Estimation	Presentation
<i>Computational Lower Bounds in Linear Algebra § SIAM AN22</i>	<i>2021</i>
Lessons from Trace Estimation Lower Bounds	Presentation
<i>Computational Lower Bounds in Linear Algebra § SIAM AN21</i>	<i>2021</i>
Hutch++: Optimal Stochastic Trace Estimation	Presentation
<i>Theory Reading Group § Johns Hopkins University</i>	<i>2021</i>

Conference Presentations.....

Fast Regression for Structured Inputs	Poster
<i>ICLR Conference</i>	<i>2022</i>
Hutch++: Optimal Stochastic Trace Estimation	Poster
<i>WALD(O) Conference</i>	<i>2021</i>
Hutch++: Optimal Stochastic Trace Estimation	Presentation
<i>SOSA Conference</i>	<i>2021</i>
The Statistical Cost of Robust Kernel Hyperparameter Tuning	Poster
<i>NeurIPS Conference</i>	<i>2020</i>
Statistical Efficiency of Optimal Kernel Sum Classifiers	Presentation, Poster
<i>ICML Conference</i>	<i>2019</i>
Statistical Efficiency of Optimal Kernel Sum Classifiers	Poster
<i>Midwest Theory Day</i>	<i>2019</i>
Optimal Secure OR Evaluation	Presentation
<i>ISIT Conference</i>	<i>2017</i>

Reading Groups.....

Hutch++: Optimal Stochastic Trace Estimation	Presentation
<i>NYU VIDA Reading Group</i>	<i>2022</i>
Introduction to Leverage Scores	Presentation
<i>NYU Tandon Theory Reading Group</i>	<i>2021</i>
Strategies for Episodic Tabular & Linear MDPs	Presentation
<i>NYU Tandon Reinforcement Learning Reading Group</i>	<i>2021</i>
Lagrangian Duality	Presentation
<i>NYU Tandon Theory Reading Group</i>	<i>2021</i>

Introduction to Differential Entropy

NYU CDS Reading Group on Information Theory

Presentation

2020

Lower Bounds for the Oracle Complexity of Convex Optimization

NYU Tandon AMLDS Reading Group

Presentation

2019

Programming Languages

Julia, Python, C++, C, LaTeX, Racket:

Proficient

Wrote Production-Worthy Code in Multiple Software Engineering Internships