Spencer Peters

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Research interests

Lattice algorithms and complexity, function inversion, cryptography

Education

Cornell University — Ithaca, NY
PhD Candidate in Computer Science — August 2019 – Present
Advisor: Noah Stephens-Davidowitz.

University of Washington — Seattle, WA
BS in Computer Science and Comprehensive Physics
College Honors, Minor in Mathematics — Sep 2014 – Mar 2019

Papers

Recursive lattice reduction–A framework for finding short lattice vectors
Divesh Aggarwal, Thomas Espitau, **SP**, Noah Stephens-Davidowitz.
Manuscript.

Lattice Problems beyond Polynomial Time
Divesh Aggarwal, Huck Bennett, Zvika Brakerski, Alexander Golovnev, Rajendra Kumar, Zeyong Li, **SP**, Noah Stephens-Davidowitz, Vinod Vaikuntanathan.
In STOC, 2023 (arxiv).

Lattice Problems in General Norms: Algorithms with Explicit Constants, Dimension-Preserving Reductions, and More.
Huck Bennett, Yanlin Chen, Zeyong Li, and **SP**.
Manuscript.

Revisiting Time-Space Tradeoffs for Function Inversion.
Alexander Golovnev, Siyao Guo, **SP**, Noah Stephens-Davidowitz.
Preprint (ECCC).

The (im)possibility of simple search to decision reductions for approximate optimization.
Alexander Golovnev, Siyao Guo, **SP**, Noah Stephens-Davidowitz.
Preprint (ECCC).

Reasoning about Causal Models with Infinitely Many Variables.
Joseph Y. Halpern and **SP**.

In AAAI, 2022.

Causal Modeling with Infinitely Many Variables.
SP and Joseph Y. Halpern.
Preprint (arxiv).

Always Asking for Advice is Often Optimal.
SP, Siddhartha Banerjee, and Joseph Y. Halpern.
Manuscript.

Honors and scholarships

Honorable Mention (NSF GRFP)	2021
Outstanding TA 2020 (Cornell CIS)	2020
Departmental Fellowship (UW Physics)	2018
Andersen Award (UW Physics)	2018
Leadership Award (National Society of Physics Students)	2017
Phi Beta Kappa	2017
Top 500 Putnam Scorers (score: 36)	2016
Finalist (National Merit)	2014

Teaching experience

Part-time TA, Cornell CIS Spring 2021
CS 4820: Introduction to Analysis of Algorithms

Head TA, Cornell CIS Fall 2020
ORIE 4742: Information Theory, Probabilistic Modeling, and Deep Learning with Scientific and Financial Applications
Average student rating: 5.0/5 on 8 responses.

Head TA, Cornell CIS Spring 2020
CS 3110: Data Structures and Functional Programming
Made 13 "crash course" videos covering recitation section material to help students with the transition to Zoom classes at the start of COVID.
Average student rating: 5.0/5 on 5 responses

Head TA, Cornell CIS Fall 2019
CS 2800: Discrete Structures
Average student rating: 4.7/5 on 10 responses.

Industry experience

Jane Street Research Desk New York, NY
Quantitative Research Intern Summer 2019
Analyzed market data and tested novel financial modeling techniques.

Microsoft Quantum Redmond, WA
Research Intern Spring 2019
Studied the effects of disorder in semiconductor-superconductor nanowires.

Microsoft Quantum — Redmond, WA
Research Intern — Summer 2018
Extended automated physics simulation toolkits with new numerical solvers.

Other experience

Keeton House — Ithaca, NY
Graduate Resident Fellow — Fall 2022-
Mentoring undergraduates in a vibrant living-learning community.

Cornell CIS Visit Days — Ithaca, NY
Scheduler — 2021, 2022, 2023
Scheduling ~500 student-faculty meetings with in-house optimization code.

Research Visits

Simons Institute Lattices Summer Cluster — Summer 2022

National University of Singapore (with Divesh Aggarwal) — Summer 2022

Talks and tutorials

Revisiting Time-Space Tradeoffs for Function Inversion — Mar 2023
University of Washington Theory Seminar

Revisiting Time-Space Tradeoffs for Function Inversion — Feb 2023
New York University Theory Seminar

Revisiting Time-Space Tradeoffs for Function Inversion — Nov 2022
MIT Cryptography and Information Seminar

Revisiting Time-Space Tradeoffs for Function Inversion — Jul 2022
National University of Singapore AlgoTheory Seminar

Revisiting Time-Space Tradeoffs for Function Inversion — May 2022
Cornell University A Exam

Always Asking for Advice is Often Optimal — Mar 2021
Cornell Theory Tea

A Beginner's Perspective on Concentration Inequalities — Aug 2020
Cornell Great Ideas in TCS Student Seminar

Service and outreach

GRASSHOPR — May 2022
Designed and taught a class introducing cryptography to middle-schoolers through an interactive game.

Cornell CIS — 2019-2020
Colloquium and Social Hour Czar.

Other interests	Cornell Buds Men's Ultimate A Team	Fall 2021-.