

# Zachary I. Schutzman

---

3401 Walnut Street, Office 409B, Philadelphia, PA 19104  
ianzach@seas.upenn.edu  
zachschutzman.com  
github.com/zschutzman

**INTERESTS** Algorithmic game theory and economics, fairness in algorithm design, differential privacy and its applications, computational social science, theoretical machine learning, mathematics of redistricting

**EDUCATION** **University of Pennsylvania** Philadelphia, PA 2016 – 2021  
Ph.D., Computer and Information Science  
Thesis: *Algorithmic Processes and Social Values*  
Advisor: Aaron Roth  
Affiliations: Warren Center for Data & Network Science, Penn Research in Machine Learning, CS Theory Research Group

**Colby College** Waterville, ME 2012 – 2016  
B.A., *cum laude*, Economics (Honors) and Mathematics  
Thesis: *Computational Simulation and Analysis of Landscape Conservation Auctions*  
Advisors: Timothy Hubbard and Sahan Dissanayake  
*Phi Beta Kappa*, William D. Adams Presidential Scholar, Distinction in Economics  
Minor: Computer Science

**RESEARCH** Authors are listed alphabetically by surname

**Algorithms and Learning for Fair Portfolio Design**

In *Proceedings of the ACM Conference on Economics and Computation* (EC), 2021  
with Emily Diana, Travis Dick, Hadi Elzayn, Michael Kearns, Aaron Roth, Saeed Sharifi-Malvajerdi, and Juba Ziani

**Geometry of Graph Partitions via Optimal Transport**

In *SIAM Journal on Scientific Computing*, Vol. 42 Issue 5. Oct. 2020  
with Tara Abrishami, Nestor Guillen, Parker Rule, Justin Solomon, Thomas Weighill, and Si Wu

**The Gerrymandering Jumble: Map Projections Permute Districts' Compactness Scores**

In *Cartography and Geographic Information Science*, Vol. 3 Issue 46. May 2020  
with Assaf Bar-Natan and Lorenzo Najt

**Trade-Offs in Fair Redistricting**

In *Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society* (AIES), 2020  
accepted with an oral presentation

**Total Variation Isoperimetric Profiles**

In *SIAM Journal on Applied Algebra and Geometry*, Vol. 3 Issue 4. Nov. 2020  
with Daryl DeFord, Hugo Lavenant, and Justin Solomon

### **Equilibrium Characterization for Data Acquisition Games**

In *Proceedings of the 28th International Joint Conferences on Artificial Intelligence (IJCAI)*, 2019

with Jinshuo Dong, Hadi Elzayn, Shahin Jabbari, and Michael Kearns

### **The Price of Privacy in the Keynesian Beauty Contest**

In *Proceedings of the ACM Conference on Economics and Computation (EC)*, 2019

with Hadi Elzayn

### **Fair Algorithms for Learning in Allocation Problems**

In *Proceedings of the ACM Conference on Fairness, Accountability, and Transparency (FAT\*)*, 2019

with Hadi Elzayn, Shahin Jabbari, Michael Kearns, Christopher Jung, Seth Neel, and Aaron Roth

### **Strategic Classification from Revealed Preferences**

In *Proceedings of the ACM Conference on Economics and Computation (EC)*, 2018

with Jinshuo Dong, Aaron Roth, Bo Waggoner, and Zhiwei Steven Wu

appeared at the Workshop on Learning in the Presence of Strategic Behavior (NeurIPS 2017) as a long oral presentation

## **OTHER PROJECTS**

### **Diffix Bug Bounty Program Winner**

Executed three linear programming reconstruction attack on a supposedly privacy-preserving data analysis product, with Travis Dick and Matthew Joseph.

Coauthored a pair of blog posts on [differentialprivacy.org](https://differentialprivacy.org) with Aloni Cohen, Sasho Nikolov, and Jon Ullman

Available at <https://differentialprivacy.org/reconstruction-theory/>,  
<https://differentialprivacy.org/diffix-attack/>

### **GerryChain**, Contributor

An open-source Python Markov Chain Monte Carlo sampler to generate ensembles of redistricting plans.

Available at <https://github.com/mggg/GerryChain>

### **District-Shortening Flow**

An introduction to ‘multiscale compactness’ using curve-shortening flow.

Available at <https://mggg.org/distflow>

### **Redistricting Gridlandia**

An gentle interactive introduction to the mathematics of redistricting.

Appeared in *Geometry v. Gerrymandering*, Moon Duchin *Scientific American*, Nov. 2018

Available at <https://mggg.org/metagraph>

## **ASSISTANT-SHIPS**

### **Graduate Research Fellow** Voting Rights Data Institute, MIT/Tufts Summer 2018

Worked on problems at the interface of mathematics, computing, and statistics with redistricting and voting rights with expert practitioners, faculty, and students from a range of disciplines.

Hosts: Moon Duchin (Tufts Mathematics) & Justin Solomon (MIT CSAIL)

<b>TEACHING &amp; MENTORSHIP</b>	<b>Voting Rights Data Institute Faculty</b> , MIT/Tufts	Summer 2019
	Co-led independent research groups of undergraduate and graduate students from various disciplinary backgrounds on topics at the intersection of mathematics, computing, and voting rights. Organized and co-taught a series of hands-on workshops introducing students to topics and techniques in optimization.	
	<b>Independent Study</b>	
	Michael Ramdatt, <i>Quadratic Voting Analysis</i> (with Bo Waggoner)	Spring 2018
	<b>Teaching Assistantships</b>	
	Algorithmic Game Theory (NETS 412), UPenn	Spring 2018
	Networked Life (NETS 112), UPenn	Fall 2017
	Game Theory (EC 379), Colby College	Spring 2016
	Data Structures and Algorithms (CS 231), Colby College	Fall 2015
	Computational Thinking (CS 151/152), Colby College	2014-2015
<b>TALKS</b>	<b>Algorithmic Redistricting and Black Representation</b>	May 2021
	MIT Workshop on Systemic Racism and Computation	
	<b>Algorithms for Applied Large-Scale Differential Privacy</b>	October 2020
	Written Preliminary Exam Presentation	
	<b>Algorithms, Fairness, and Redistricting</b>	April 2020
	Penn CIS Student Colloquium	
	<b>Trade-Offs in Fair Redistricting</b>	February 2020
	AIES	
	<b>Equilibrium Characterization for Data Acquisition Games</b>	August 2019
	IJCAI	
	<b>Introduction to the Metagraph of Districting Plans</b>	June 2019
	Voting Rights Data Institute	
	<b>Graphs, Geometry, and Gerrymanders</b>	February 2019
	University of Toronto Dept. of Mathematics <i>Diet Graduate Seminar</i>	
	<b>Shape Analysis for Redistricting</b>	February 2019
	University of Toronto Dept. of Mathematics <i>Hyperbolic Lunch Seminar</i>	
	<b>Computational Simulation and Analysis for Landscape Auctions</b>	May 2016
	Honors Thesis Defense, Colby College Department of Economics	

**SERVICE****Conference Reviewing**

NeurIPS Workshop on Machine Learning for Economic Policy 2020 (PC), AAAI 2020 (PC), ICML 2019, EC 2018

**Department**

Dean's Doctoral Advisory Board, Summer 2020 COVID-19 Communications Committee, Volunteer for applicant support program for prospective students from groups underrepresented in computing, Student representative on CIS doctoral requirements committee

**TECHNICAL  
SKILLS**

Python, C++, Julia,  
MATLAB, QGIS, Isadora,