

Manuel Sabin

msabin.github.io
msabin27@gmail.com

RESEARCH INTERESTS – Fine-Grained Complexity Theory, Pseudorandomness, Cryptography, Computational Learning, Circuit Lower Bounds, and how these all influence each other

– Interrogating the social impact of CS research, such as Algorithmic “Fairness” and Machine Learning’s use in the practice of Law, and the implicit values it often embeds

EMPLOYMENT Postdoctoral Researcher, ERC-funded *COHUBICOL* Project 2020-2021
Hosted by Mireille Hildebrandt at Radboud University

– Collaborated with Lawyers and Legal Philosophers to account for ML’s effect on legal outcomes, legal decision-making, and the foundations of the Rule of Law

– Served a translational role, explicating how Machine Learning (ML) operates and co-creating vocabularies at the intersection of Law and CS

EDUCATION PhD UC Berkeley, *Computer Science* 2014-2020
Advised by Shafi Goldwasser and Christos Papadimitriou
Thesis Title: *On the Utility of Fine-Grained Complexity Theory*

BA CSU Sacramento, *Math/Computer Science* 2009-2014
Minor: Statistics
Graduated with Highest Honors

PUBLICATIONS Learning with Distributional Inverters
with Eric Binnendyk, Marco L. Carmosino, Antonina Kolokolova, and Ramyaa Ramyaa,
in ALT 2022.

XOR Codes and Sparse Learning Parity with Noise
with Andrej Bogadnov and Prashant Nalini Vasudevan, in SODA 2019.

Proofs of Work from Worst-Case Assumptions
with Marshall Ball, Alon Rosen, and Prashant Nalini Vasudevan, in CRYPTO 2018.

Fine-Grained Derandomization: From Problem-Centric to Resource-Centric Complexity
with Marco L. Carmosino and Russell Impagliazzo, ICALP 2018.

Average-Case Fine-Grained Hardness
with Marshall Ball, Alon Rosen, and Prashant Nalini Vasudevan, STOC 2017.

INTERNSHIPS Visiting Researcher, *MIT*, Advised by Ryan Williams Fall 2019
Visiting Researcher, *UC San Diego*, Advised by Russell Impagliazzo Summer 2018
Visiting Researcher, *CUHK*, Advised by Andrej Bogdanov Summer 2017
FACT Center, *IDC Herzliya*, Advised by Alon Rosen Summer 2016
TRUST REU, *Stanford University*, Advised by Dan Boneh Summer 2013

ORGANIZED WORKSHOPS Resistance AI Workshop, co-organized for NeurIPS 2020
– Co-organized with members of the Radical AI network with the lens of asking “How does AI shift power in the world?”
– Centered Black and Indigenous activists, researchers, and organizers to present and discuss how to shift power back to marginalized communities

Manifesting the Sociotechnical: Experimenting with Methods for Social Context and Social Justice, *with Ezra Goss, Lily Hu, and Stephanie Teeple*, in ACM FAccT* 2020.

- Collaborated with interdisciplinary team to create and run a workshop addressing the many Science and Technology Studies (STS) critiques of Algorithmic Fairness
- Guided Fairness researchers through Community Organizing-inspired power analysis techniques to understand power differentials inherent in the field

**PROGRAM
COMMITTEE**

Beyond Fairness: Towards a Just, Equitable, and Accountable Computer Vision
Workshop organized by Emily Denton and Timnit Gebru, at CVPR 2021.

Resistance AI

Jointly organized workshop at NeurIPS 2020.

**ORGANIZING
AND
ENGAGEMENT**

Organizer in the Radical AI Network 2020-2021

- Active member of the Radical AI network, helping form its principles, public statements, and activities as it has rapidly grown
- Co-organized the Resistance AI workshop for NeurIPS 2020

Prominently Featured in Simons Institute Educational Short Film Summer 2021

- Simons Institute’s Theory Shorts: *Until the Sun Engulfs the Earth: Lower Bounds in Computational Complexity*
- Explained Complexity Theory for a general audience in plain English

Presented at Queer in AI Workshop at ICML Fall 2020

- Gave a talk “*Queer*” in *AI: Moral Injury and Going Beyond Resilience*
- Gave language and commiseration to the experience of being marginalized in academia and tech

AI Policy and Queer Privacy Panel at Queer in AI Workshop at ICML Fall 2020

- Panelist with Kade Crockford and Alex Hanna, moderated by Jevan Hutson

Founded the QTPRES Conference Spring 2020 (*postponed due to COVID-19*)

- Created, secured funding for, and co-organized *QT Presenters: QTPOC Reclaiming Education and Science (QTPRES)* Conference for sharing STEM concepts with the Queer, Trans, and POC (QTPOC) community in the SF Bay Area
- Reframed ‘STEM’ as ‘the type of truth-seeking QTPOC are often excluded from’ (in contrast to the truth-seeking of poetry, art, film, music, dance etc)
- New framing curbs STEM insecurities and allows the community to redefine the culture, presentation norms, questions of interest, framing etc from scratch

Skype A Scientist 2017-2020

- Skyped with various on-site and online high school and elementary school classrooms across the US including rural areas and with diverse demographics
- Gave pop intuitions of theoretical CS and explained academic pathways, funding, traveling, and opportunities

EECS Peer at UC Berkeley 2017-2020

- Hold office hours for graduate students in EE and CS as a peer counselor

Volunteered for Empowering Womxn Of Color Conference (EWOCC) Spring 2018

- Was a general volunteer for EWOCC at UC Berkeley, helping this important conference go smoothly
- Learned conference organization skills to later create my QTPRES conference for the Bay Area QTPOC community

Dinner With a Scientist Spring 2018

- Had dinner with groups of 4th and 5th grade Oakland elementary students from underrepresented backgrounds and gave them insight into a career in STEM
- Showed math “magic tricks” to poise math as a creative field that can get weird and interesting in higher education

Mentor in Directed Reading Program at UC Berkeley Fall 2017

- Mentored Berkeley undergraduate Sichao (Jeff) Xu through complexity theory and derandomization literature

Created and Maintained Blog *On The Shoulders Of Windmills* 2015-2016

- Posted on our responsibilities as academics and scientists and on technology through a sociotechnical lens
- Posted on my experiences in graduate school and openly on mental health in academia

Graduate Panelist for the CSU Sacramento SHPE Chapter Conference Fall 2014

- Talked to Latinx undergraduates about the process and opportunities of academia
- Gave information and resources on REUs, fellowships, and application processes

Featured in *Si Magazine* that features role models for Latinx youths Fall 2014

TEACHING AND OUTREACH

E125: Engineering Ethics and Society Spring 2020

- Worked with Prof. Raluca Scarlat to co-teach ethics in engineering through a sociotechnical lens
- Helped direct reading list, co-facilitated class discussions, and graded

Created and Taught Lessons in the Berkeley Math Circle Fall 2018

- Introduced high school and middle school students to the philosophy of complexity theory using Interactive and Zero-Knowledge Proofs as concrete concepts

CS276: Graduate Cryptography, Graduate Student Instructor Fall 2015

- Assisted Alessandro Chiesa, *UC Berkeley*
- Created/taught lessons on Zero-Knowledge Proofs, held office hours, and graded

CS172: Computability and Complexity, Graduate Student Instructor Spring 2015

- Assisted Luca Trevisan, *UC Berkeley*
- Ran discussion sections, held office hours, and graded

Jointly Taught NSF LSAMP Summer Math Program Summer 2014-2015

- Taught incoming CSU Sacramento underrepresented STEM students
- Guided students through problem solving on recreational math problems and calculus problems to reintroduce them to math as a creative and social activity
- Trained in how to “spread thinking around a room”

Project Creator/Leader for UC Berkeley SMASH Academy Summer 2014

- Designed five-week math project for low-income high school STEM students
- Used problem solving of recreational math problems, building to exploring pure math through Symmetry Groups to show math as a creative enterprise

Assisted COSMOS Program with Monica Vazirani, *UC Davis* Summer 2014

- Helped teach Summer program for exceptional high school students for one week
- Gave students problems in basic Abstract Algebra and assisted them

STAT50: Introduction to Probability and Statistics, Teaching Assistant Fall 2012

- Assisted Dr. Coşkun Çetin, *CSU Sacramento*
- Tutored students in Probability and held office hours

	Tutor in California State University Sacramento Math Lab – Tutored diverse undergraduate population in all core math courses	2011-2013
INVITED TALKS	Aalborg University SECURE Workshop <i>Participatory Privacy: Towards Returning Power and Autonomy to Communities</i>	May 2021
	Boston University Algorithms and Theory Seminar <i>Discriminatory and Liberatory Algorithms: Contextualizing and Renaming Algorithmic “Fairness”</i>	October 2020
	Mechanism Design for Social Good Workshop <i>Discussant for Keynote Speaker Stephanie Dinkins</i>	August 2020
	ICML Queer in AI Workshop <i>“Queer” in AI: Moral Injury and Going Beyond Resilience</i>	July 2020
	Resistance AI Network <i>Discriminatory and Liberatory Algorithms: Contextualizing and Renaming Algorithmic “Fairness”</i>	June 2020
	UC San Diego Theory Seminar <i>Discriminatory and Liberatory Algorithms: How Do We Define “Fair” Responsibly?</i>	May 2020
	Mechanism Design for Social Good Working Group on Bias <i>Discriminatory and Liberatory Algorithms: How Do We Define “Fair” Responsibly?</i>	March 2020
	Swarthmore College Computer Science Department <i>Discriminatory and Liberatory Algorithms: Restructuring Algorithmic “Fairness”</i>	February 2020
	Oberlin College Computer Science Department <i>Discriminatory and Liberatory Algorithms: Restructuring Algorithmic “Fairness”</i>	January 2020
	MIT Algorithms and Complexity Seminar <i>Discriminatory and Liberatory Algorithms: Restructuring Algorithmic “Fairness”</i>	November 2019
	Simons Institute Pseudorandomness Reunion <i>Fine-Grained Derandomization</i>	June 2018
	UC San Diego Theory Seminar <i>Fine-Grained Derandomization</i>	June 2018
	MIT Algorithms and Complexity Seminar <i>Fine-Grained Derandomization</i>	April 2018
	UC Berkeley Theory Lunch <i>Fine-Grained Derandomization</i>	February 2018
	Simons Institute Industry Day <i>Proofs of Work from Worst-Case Assumptions</i>	March 2017
	Stanford Theory Lunch <i>Average-Case Fine-Grained Hardness</i>	February 2017

	UC Berkeley Theory Lunch <i>Average-Case Fine-Grained Hardness</i>	January 2017
	Simons Institute Fine-Grained Complexity Reunion <i>Average-Case Fine-Grained Hardness</i>	December 2016
PARTICIPATED WORKSHOPS	Beyond Fairness: Towards a Just, Equitable, and Accountable Computer Vision <i>CVPR 2021</i>	Summer 2021
	CRYPTIC COMMONS: Transdisciplinary Probes of the Ideal and Real World in Actual Cyber-Physical Systems <i>SECURE at Aalborg University</i>	Spring 2021
	Philosopher's Seminar: Interpretability Issues in Machine Learning <i>COHUBICOL</i>	Fall 2020
	Fairness <i>Simons Institute Summer Cluster</i>	Summer 2019
	Lower Bounds in Computational Complexity <i>Simons Institute Semester</i>	Fall 2018
	Meta-Complexity <i>Oxford Mathematical Institute</i>	July 2018
	Pseudorandomness <i>Simons Institute Semester</i>	Spring 2017
	Winter School on the Sum of Squares Algorithm <i>UC San Diego</i>	January 2017
	Proof Complexity <i>Chebyshev Laboratory at St.Petersburg State University</i>	May 2016
	Fine-Grained Complexity & Algorithm Design <i>Simons Institute Semester</i>	Fall 2015
	Cryptography <i>Simons Institute Semester</i>	Summer 2015
	SAT & Satisfiability Modulo Theories Summer School <i>Stanford University</i>	July 2015
	Randomization in Numerical Linear Algebra <i>Gene Golub SIAM Summer School in Delphi, Greece</i>	June 2015
HONORS AND AWARDS	NSF Graduate Research Fellowship	Spring 2015
	Chancellor's Fellowship (campus-wide), <i>UC Berkeley</i>	Spring 2014
	Excellence Award, <i>Department of Computer Science, UC Berkeley</i>	Spring 2014
	Faculty Endowment Scholarship (campus-wide), <i>CSU Sacramento</i>	Spring 2014
	Commencement Speaker, <i>CSU Sacramento</i>	Spring 2014
	Roger Leezer Scholarship, <i>Department of Math, CSU Sacramento</i>	Fall 2013
	Stewart Moredock Scholarship, <i>Department of Math, CSU Sacramento</i>	Fall 2013
	President of CSUS Chapter of SIAM, <i>CSU Sacramento</i>	2012-2013