

Manuel Sabin

cs.berkeley.edu/~msabin
msabin@berkeley.edu

RESEARCH INTERESTS	<ul style="list-style-type: none">– Fine-grained complexity theory, pseudorandomness, cryptography, circuit lower bounds, and how these all influence each other– Algorithmic “Fairness” and examining technology and the field itself’s methodologies through an interdisciplinary, socio-technical lens
EDUCATION	<div>PhD UC Berkeley, <i>Computer Science</i> 2014-2020 Advised by Shafi Goldwasser and Christos Papadimitriou Thesis Title: <i>On the Utility of Fine-Grained Complexity Theory</i></div> <div>BA CSU Sacramento, <i>Math/Computer Science</i> 2009-2014 Minor: Statistics Graduated with Highest Honors</div>
PUBLICATIONS	<div>XOR Codes and Sparse Learning Parity with Noise <i>with Andrej Bogadnov and Prashant Nalini Vasudevan</i>, in SODA 2019.</div> <div>Proofs of Work from Worst-Case Assumptions <i>with Marshall Ball, Alon Rosen, and Prashant Nalini Vasudevan</i>, in CRYPTO 2018.</div> <div>Fine-Grained Derandomization: From Problem-Centric to Resource-Centric Complexity <i>with Marco L. Carmosino and Russell Impagliazzo</i>, ICALP 2018.</div> <div>Average-Case Fine-Grained Hardness <i>with Marshall Ball, Alon Rosen, and Prashant Nalini Vasudevan</i>, STOC 2017.</div>
WORKSHOPS	<div>Manifesting the Sociotechnical: Experimenting with Methods for Social Context and Social Justice, <i>with Ezra Goss, Lily Hu, and Stephanie Teeple</i>, in ACM FAT* 2020.</div> <ul style="list-style-type: none">– 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 philosophies and methodologies on Fairness Machine Learning examples to move the field to being praxis-centered– Based on our work here we are submitting to FAT* 2021 a framework that re-structures Algorithmic Fairness in a way that addresses critiques of the field
INTERNSHIPS	<div>Visiting Researcher, <i>MIT</i>, Advised by Ryan Williams Fall 2019</div> <div>Visiting Researcher, <i>UC San Diego</i>, Advised by Russell Impagliazzo Summer 2018</div> <div>Visiting Researcher, <i>CUHK</i>, Advised by Andrej Bogdanov Summer 2017</div> <div>FACT Center, <i>IDC Herzliya</i>, Advised by Alon Rosen Summer 2016</div> <div>TRUST REU, <i>Stanford University</i>, Advised by Dan Boneh Summer 2013</div>
HONORS AND AWARDS	<div>NSF Graduate Research Fellowship Spring 2015</div> <div>Chancellor’s Fellowship (campus-wide), <i>UC Berkeley</i> Spring 2014</div> <div>Excellence Award, <i>Department of Computer Science, UC Berkeley</i> Spring 2014</div> <div>Faculty Endowment Scholarship (campus-wide), <i>CSU Sacramento</i> Spring 2014</div> <div>Commencement Speaker, <i>CSU Sacramento</i> Spring 2014</div> <div>Roger Leezer Scholarship, <i>Department of Math, CSU Sacramento</i> Fall 2013</div>

Stewart Moredock Scholarship, *Department of Math, CSU Sacramento* Fall 2013
 President of CSUS Chapter of SIAM, *CSU Sacramento* 2012-2013

TEACHING AND OUTREACH

E125: Engineering Ethics and Society Spring 2020
 – Will collaborate with Prof. Raluca Scarlat to co-teach ethics in engineering through a sociotechnical lens
 – With Prof. Scarlat will co-create the reading list, co-facilitate all class discussions, create and teach my own modules on ethics in Computer Science, and grade
 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 2011-2013
 – Tutored diverse undergraduate population in all core math courses

FURTHER DISSEMINATION AND OUTREACH

Prominently Featured in Simons Institute Educational Short Film Upcoming
 – Explained Complexity Theory for a general audience in plain English
 Founded and Ran the QTPRES Conference Spring 2020
 – 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 (EWOC) Spring 2018
 - Was a general volunteer for EWOC 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 *Sí Magazine* that features role models for Latinx youths Fall 2014

INVITED TALKS

- MIT Algorithms and Complexity Seminar November 2019
Discriminatory and Liberatory Algorithms: Restructuring Algorithmic “Fairness”
- Simons Institute Pseudorandomness Reunion June 2018
Fine-Grained Derandomization
- UC San Diego Theory Seminar June 2018
Fine-Grained Derandomization
- MIT Algorithms and Complexity Seminar April 2018
Fine-Grained Derandomization
- UC Berkeley Theory Lunch February 2018
Fine-Grained Derandomization
- Simons Institute Industry Day March 2017
Proofs of Work from Worst-Case Assumptions
- Stanford Theory Lunch February 2017
Average-Case Fine-Grained Hardness

	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	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
EXTERNAL REVIEWER	Journal of Cryptology (JoC) 2019, CRYPTO 2018, Foundations of Computer Science (FOCS) 2018, Theory of Cryptography Conference (TCC) 2018, Foundations of Computer Science (FOCS) 2017	