Krystal Maughan

Krystal.maughan@gmail.com
Github: https://github.com/kammitama5
Tel: 607.342. 6970
Blog: https://kammitama5.github.io/

Research Interests: Isogeny-Based Cryptography, Mathematical Cryptography, Elliptic Curves, AI Interpretability, Game Theory, Random Processes, Combinatorics, Graph Theory

---

University of Vermont, PhD student   2019-present
Computer Science PhD student, minor in Pure Mathematics

RESEARCH EXPERIENCE:
Research Assistant (Vermont)   2021-present
PhD Supervisors: C. Vincent, J. Near: Research on Isogeny-Based Cryptography
- *Mathematical Cryptography Research*

Research Assistant: P. Rombach: Research on Computational Combinatorics   **2022-present**
- *Algebraic Combinatorial Graph Theory Research*

Research Assistant (Vermont)   2019-2022
Supervisor: Joe Near: Research on Provable Fairness and (Differential) Privacy Using Machine Learning. Funded via Amazon Research Award (2020-2022 PI: J. Near, D. Darais).

Working Preprints:
- ❖ *Mathematical Cryptography: Work on Compositional Isogeny Schemes (ongoing)* 2022-present
  (Mentor: C. Vincent)
- ❖ *Combinatorics: Work on Computational Combinatorial Graph Theory research*   2022-present
  (Mentor: M. Rombach) (ongoing)

Preprints:
- ❖ *"Price of Anarchy in Selfish Routing on the Lightning Network" (ongoing)*   2022-present
  *(R. Pickhardt, S. Alscher, **K. Maughan**)*
- ❖ *"Improving Utility for Analysis of Correlated Columns using Pufferfish Privacy"*   2022
  *(**Maughan, K.** and Near, J.)*
- ❖ *Prediction Sensitivity: Continual Audit of Individual Fairness in Deployed Models*   2022
  *(**Maughan, K.**, Ngong, I., Near, J.) (**submitted: under review***)*
- ❖ *Prediction Sensitivity: Continual Audit of Counterfactual Fairness in*   2022
  *Deployed Classifiers (**Maughan, K.**, Ngong, I., Near, J.)*
- ❖ *"Continual Audit of Individual Fairness in Deployed Classifiers via Prediction*   2021
  *Sensitivity" (**Maughan, K**, I. Ngong and J. Near)*

Workshop Publications:
- ❖ *"Towards a Measure of Individual Fairness for Deep Learning"*   2020
  *(**Maughan, K.** and Near, J.) - presented as poster for **MD4SG***
- ❖ *"Towards Auditability for Fairness in Deep Learning"*   2020
  *(Ngong, I., **Maughan, K.** and Near, J.)- presented as poster for **AFCI at NeurIPS***

Workshop Conference Posters:

- ❖ *"Compositional Isogeny Schemes"- presented as poster at **ACM Richard Tapia** 2022 **Conference** (**Maughan, K**)*
- ❖ *"Continual Audit of Individual Fairness in Deployed Classifiers via Prediction* 2022 *Sensitivity" at **EAAMO Doctoral Consortium***
- ❖ *"Archipelago Penseé" (**Maughan, K**.)* 2020 *Presented writing and artwork as poster for **RAIS (Resistance AI) at NeurIPS***

Whitepapers:

- ❖ *Client Telemetry Aggregation, Microsoft internal (joint work with: P. Angulo, PhD)* 2021

Collaboration on Other Research Projects in Progress:

- ❖ ***Women in Number Theory 6 at BIRS** (Banff, Canada) (selected participant)* 2023 Research on "Machine Learning and Arithmetic Geometry / Statistics" (Number Theory research led by mentors K. Lauter, R. Newton and co-authors)
- ❖ ***OpenMined Medical Federated Learning Program** (ongoing)* 2022 *(joint work with with several co-authors)*

Graduate Teacher's Assistant, Fall/Spring 2019-2020 (Vermont) **2019-2020**
Compiler Construction with Haskell (taught by Joe Near) 2020
Advanced Web Design (taught by B. Erickson)
Programming with Matlab (taught by R. Dasari) 2019
Data Privacy with Jupyter, Python (taught by J. Near)

GRANT WRITING / PROPOSALS

- ❖ *Summer of Bitcoin, "Price of Anarchy in Selfish Routing On the Lightning* 2022 *Network" (Research proposal with 0.4% acceptance rate, Awarded $3,000)*
- ❖ *COST Action Proposal OC-2021-1-25315 "Mathematics and Algorithmics of* 2021 *Group actions and Isogenies for Cryptography" (Secondary Proposer)*
- ❖ *Microsoft Research, Reinforcement Learning Open Source Festival Proposal* 2021 *(Awarded $10,000)*
- ❖ *CDS&E Computational and Data-Enabled Science and Engineering* 2020 *Database Grant Proposal for SageMaths (as Key Personnel) (PI B. Hutz, PhD) (not awarded)*
- ❖ *Google Summer of Code, Proposal to Haskell.org* 2018 *(Awarded $6,000)*
- ❖ *Helium Grant, (for exploring questions on the edge of mainstream thinking)* 2018 *(1 of 11 chosen out of 700 applicants; Awarded $1,000)*

RESEARCH AWARDS
2nd Place Winner, *Best Research Project (tie with X. Zhang),* 2022
UVM CS Research Day for "Price of Anarchy in Selfish Routing on the Lightning Network"
Best Poster, *Brilliant Idea Category, Mediterranean Machine Learning Summer School* 2021

MERIT-BASED MENTORSHIPS / RESEARCH MENTORSHIPS
Mentee, Algorithmic Game Theory Workshop (AGT), Economics and Computation 2022
    - *(mentor: H. Zhang, PhD), paper dissection and Ask me Anything session*
Mentee, MD4SG Mentorship Program, with J. Finocchiaro, PhD (1 of 3) 2022-2023

MERIT-BASED MENTORSHIPS / RESEARCH MENTORSHIPS

Mentee, AiC Connectors Program with Facebook, with S. Lim, PhD	2022
Mentee, BlackComputeHer Fellowship, with Y. Rankin, PhD, A. Robinson, M.Ed	2022
Mentee, Microsoft's Tech Resilience (mentors: O. Kroshkina, M. Ward)	2022
Mentee, Google's CS Research Mentorship Program (CSRMP) with A. Lees, PhD	2021
Mentee, AiC Connectors Program with Facebook with O. Dalleleau, PhD	2021
Mentee, She256 Blockchain Group with P. Mishra, PhD	2021
Mentee, Women in Privacy and Security (WISP), D. Sharma, PhD	2021
Mentee, Algorithmic Game Theory (AGT), Economics and Computation Conference	2020
- *Global Outreach Mentorship with S. Gupta, PhD (EC 2020)*	
Mentee, LatinX in AI Research Workshop Mentorship, C. White, PhD (NeurIPS 2021)	2021
Mentee, LatinX in AI Research Workshop Mentorship with J. Barajas, PhD (ICML 2020)	2020
Mentee, Mentored by Amal Ahmed, PhD,	2020-present
- *ICFP 2020, ACM SIGPLAN-Mentorship, organized by T. Ringer*	
Mentee, Lighthouse3 AI Ethics Mentoring Externship with F. McEvoy (1 of 20 chosen)	2020
Mentee, Code2040 Fellowship with Ben Waber, PhD	2020

ACADEMIC REVIEWER

Reviewer, Springer AI and Ethics Journal	2020 - present
Reviewer, AAAI 2023 Workshop on Privacy Preserving Artificial Intelligence (PPAI)	2022
Reviewer, PML4DC (Practical Machine Learning for Developing Countries), ICLR	2021- 2022
Reviewer, Algorithmic Fairness through the Lens of Causality and Privacy	2022
- *Extended Abstract and Paper Track*	
Reviewer, BlackAIR Summer Research Grant Program	2021
Reviewer, ICLR Distributed and Private Machine Learning workshop (DPML)	2021
Committee Reviewer, HCI Track, GHC (Grace Hopper Conference)	2021
Reviewer for AFCR workshop at NeurIPS (Fairness, Accountability, Robustness)	2021
Reviewer for AFCI workshop at NeurIPS (Fairness and Accountability)	2020
Reviewer for Black in AI at NeurIPS workshop	2020-2022
Reviewer and Programme Committee Member, LXAI@ICML Workshop	2020
Committee Reviewer, HCI Track, GHC (Grace Hopper Conference)	2020
Chair Reviewer, PML4DC (Practical ML for Developing Countries) workshop, ICLR	2020
Reviewer, Tapia Conference (Panels and Workshops)	2020 - 2022
Reviewer, Travel Grant Applications, Black in AI for AAAI	2020

ACADEMIC JOURNALS (AI/Machine Learning)

Board Member, AI and Ethics, Springer	2020

REVIEWER (NON-ACADEMIC PEDAGOGICAL)

Published Book, "Effective Haskell" by R. Skinner	2022
Medium Post, "Pure Print Style Debugging in Haskell" by R. Skinner	2022

RESEARCH PhD INVITATIONS (ABRIDGED)

Participant, WIN6, "Machine Learning and Arithmetic" (mentors: K. Lauter, R. Newton)	2023
- *Research in Arithmetic Statistics and Machine Learning at BIRS (Banff, Canada)*	
Participant, IPAM "Machine Assisted Proofs" (Feb 13-17), (Los Angeles, California)	2023

RESEARCH PhD INVITATIONS (ABRIDGED)

Participant, Doctoral Consortium at ACM Richard Tapia Conference (Washington, D.C.) 2022
Invited Participant, Doctoral Consortium at ACM EAAMO Conference (via travel award) 2022
Participant,1st Roots of Unity Summer School: Arithmetic Geometry group (fully-funded) 2022
(focus on Arithmetic Geometry and Arithmetic Statistics with six PhD students; also
Invited to proceeding AWM Research Symposium at University of Minnesota (UMN))
Invited Participant, IAS/ Park City Mathematics Institute (PCMI)   2022
Graduate Summer School, Computational Number Theory (fully-funded: declined offer)
Virtual Participant, Preliminary Arizona Winter School: Heights and Model Theory   2022
- "Introduction to Model Theory with Applications" with R. Nagloo
Virtual Participant, 16th International Symposium on Orthogonal Polynomials,   2022
Special Functions and Applications
Virtual Participant, Random : The Conference on Randomization and Computation   2022
Virtual Participant, BIRS, Algebraic Methods in Coding Theory and Communication   2022
Virtual Participant, COGENT: Cohomology, Geometry and Explicit Number Theory   2022
Virtual Participant, Stinson66: New Advances in Designs, Codes and Cryptography   2022
Virtual Attendee, Recent Advances on Total Search Problems   2022
Virtual Participant, Arizona Winter School   2022
- Automorphic Forms beyond GL2: Unitary Groups Study Group (mentor E. Eischen)
Virtual Participant, West Coast Number Theory (WCNT): Problems in Number Theory   2021
Virtual Participant, Doctoral Consortium at ACM FAccT Conference   2021
Participant, Community-Driven Cryptography Seminar (Brown / John Hopkins)   2021-present
Participant, GREPSEC V: 2021
- (Graduate Students in Privacy and Security Early Career Workshop)
Participant, Isogeny-Based Cryptography Winter School   2021
Participant, Post-Quantum Networks Workshop   2021
Participant, PRIMA Summer School   2021
- Rational curves and moduli spaces in arithmetic geometry
Initiative for Cryptocurrencies and Contracts (IC3) Blockchain Bootcamp   2021
- Worked on group project : Fairness consensus for Miner Extractable Value (MEVs)
- Implemented Aequitas protocol from paper with authors for fairness simulation
- One of top four winning teams chosen
The Alan Turing Institute:
- Invited Participant,"Threats and Opportunities for AI in Cybersecurity"   2021
- Invited Participant,"Society-centric approaches to AI challenges in   2021
Participant, Scottish Programming Languages and Verification School   2021
Invited Participant,"Key themes for informing a Research Roadmap",   2021
Alan Turing Institute, Invited Participant, "Environmental Enables for AI challenges in" 2021
Simons Institute, Average-Case Complexity: From Cryptography to Statistical Learning 2021
Simons Institute, Optimization Under Symmetry   2021
Simons Institute, Innovations in Theoretical Computer Science (ITCS)   2021
Simons Institute, Geometric Methods in Optimization and Sampling Bootcamp   2021
Participant, Self Organizing Conference on Machine Learning (SOCML)   2021
- Machine Learning, and Privacy session, Moderated by U. Erlingsson   2021
- organized by I. Goodfellow (1 of 9 chosen)

MERIT-BASED GRANTS / FELLOWSHIPS / SCHOLARSHIPS (ABRIDGED)

(Privacy Engineering Practice and Respect) PEPR Grant, S&P Oakland	*2022*
Fellow, BlackComputeHER (2022-2023) (1 of 11)	*2022*
Scholarship winner (to attend Richard Tapia Celebration of Diversity in Computing)	*2022*
- (registration, flight, hotel costs, Washington D.C. courtesy BNY Mellon)	
Google Grace Hopper Conference (GHC) Scholarship	*2021*
WISP & Black Hat USA Briefings Scholarship (1 of 25)	*2021*
Kernel Fellowship Block III via Gitcoin (Security: Zero Knowledge Proofs project)	*2021*
Gitcoin Scholarship for Women (for Kernel Fellowship Block III)	*2021*
She256 Mentorship focused on ZK Snarks (6 months)	*2021*
USENIX Security Conference 2021 (via USENIX Diversity Grant via GREPSEC V)	*2021*
TechX Social Impact / Harvard Franklin Fellowship (1 of 12)	*2020*
USENIX Enigma Grant	*2021*
NCAS Workshop participant (NASA Community College Aerospace Scholars)	*2016*
Who's Who/ Peggy Williams Memorial Scholarship/ Best BFA Award (Best of Major)	*2008*

OTHER GRANTS/ FELLOWSHIPS (ABRIDGED)

Northeast Combinatorics, Discrete Maths Day (lodging)	*2022*
Upstate Number Theory Conference 2021 (lodging provided)	*2021*
IEEE Symposium on Security and Privacy (student travel grant, complimentary ticket)	*2021*
4th Annual ZK-Proof Workshop (complimentary ticket)	*2021*
WISP Privacy+Security Conference	*2021*
- EU Data Law / De-Identification Workshop (Scholarship via WISP)	
ICERM (Brown University) Variable Precision in Mathematical & Scientific Thinking	*2020*
RWC2020 (Real World Crypto: registration, flight, lodging) Grant via IACR	*2020*
Sage-Days-104 : To work on SageMath Software: Arithmetic Dynamics	*2019*
Simons Institute (Berkeley) Error-Correcting Codes and High-Dimensional	*2019*
Expansion Boot Camp (attendee)	
ICERM (Brown University) Encrypted Search Workshop Grant (Lodging provided)	*2019*
Cornell Number Theory Conference Grant (Lodging provided)	*2019*
MSRI (Mathematical Sciences Research Institute) Grants to attend:	
* Optimal Transport and applications to machine learning and statistics*	*2020*
Connections for Women:	*2019*
- Derived Algebraic Geometry, Birational Geometry and Moduli Spaces workshop	
- Introductory Workshop: Derived Algebraic Geometry and Birational Geometry And Moduli Spaces	
Racket Summer School (National Science Foundation Grant)	*2018-2019*
PLMW (Programming Languages Mentorship Workshop)	*2018*
ICFP (International Conference Functional Programming)	
PLMW(Programming Languages Mentorship Workshop)	*2018*
PLDI (Programming Languages Design and Implementation)	
OPLSS (Oregon Programming Languages Summer School Grant) - declined offer	*2018*

ACADEMIC SERVICE (ABRIDGED)

Co-Organizer, Co-submitting Summer Workshop, ICLR (with T. Burns, R. Liu)	*2022*
Co-Organizer, Tiny Papers Track, ICLR (with T. Burns, R. Liu) (Kigali,Rwanda)	*2023*

ACADEMIC SERVICE (ABRIDGED)

ICLR Program Committee, ICLR DEI Committee (with R. Liu)	2022, 2023
Panelist, Google CSRMP (Computer Science Research Mentorship Program)	2022
Panelist, PhD recruiting event (included multiple schools, sponsored by CodePath)	2020
Student Volunteer, ICFP (International Conference Functional Programming)	2020
Student volunteer, ICFP (International Conference Functional Programming)	2018
Student volunteer, PLDI (Programming Languages Design and Implementation)	2018
Student volunteer, POPL (Principles of Programming Languages)	2018
Student volunteer, SPLASH (Systems, Programming, Languages, and Applications) (declined offer)	

INDUSTRY PhD INVITATIONS (ABRIDGED)

Participant, Meta's Uniting Scholars in Research (Menlo Park, Palo Alto) (1 of 35)	2022
Virtual Participant, Jane Street's Preview Program, The Game Show / Trading Games	2022
Virtual Participant, Adobe's Experience Day:Research Track (Emerging Devices)(1 of 35)	2022
Virtual Participant, Unity Technologies, "Celebrating Creators of Color"	2022
Virtual Participant, Palo Alto Networks, "Rock Your Resume" event	2022
Virtual Participant, BNY Mellon, "Bots & Blind Spots: Biases in Machine Learning"	2022
Virtual Participant, JP Morgan Chase & Co. Advancing Hispanic & Latinos Summit	2022
Virtual Participant, Asana, AsanaLaunch Interview Prep Series (1 of 50)	2022
Virtual Participant, Scale AI Machine Learning event (1 of 40)	2022
Participant, JP Morgan, Advancing Black Pathways in AI & Quant Modelling Summit	2021
Participant, Facebook, Amplified: Above & Beyond Computer Science Program (PhDs)	2021
Participant, Facebook's Amplified: Virtual Vivid in Research (1 of 30)	2021
Participant, Galois 1st Summer School on Trustworthy Machine Learning (1 of 35)	2021
Participant (via CSRMP), Google PhD Fellowship Summit	2021
Participant, Jane Street PhD Symposium (New York, remote) (Quant Research)	2021
Participant, JP Morgan, Advancing Black Pathways in Data Science	2021
Participant, TwoSigma Mock Interview Day for Early Career Women (Quant Research)	2021
Participant, Hudson River Trading (HRT) Systems Engineering Tech Talks (1 of 14)	2021
Participant, Adobe, "The Future of Creativity" (Virtual)	2020
Participant, Microsoft Research, Frontiers in Machine Learning (Redmond, remote)	2020
Participant, Discover Bloomberg: Women in Engineering event (New York, remote)	2020
Participant, Twitter PhD ML Flock Event (New York, Boston office)	2019

GRADUATE SCHOOL INTERNSHIPS

JP Morgan, Quantitative AI Research, Summer Associate (New York) (1 of 10)	2022

- JP Morgan Research Workshop Publication contribution
  (mentors: S. Mishra PhD, D. Ley, A. Anzagira, E. Albini, D. Magazzeni, PhD)

Summer of Bitcoin, PhD Research intern (mentor: R. Pickhardt)	2022

- Modelling congestion games for Simulating Price of Anarchy Selfish Routing
  to show the Boundary of Channel Depletion in the Bitcoin Lightning Network

Microsoft Research, Independent Contractor, Summer 2021 (New York: remote)	2021

- Reinforcement Learning Distributed pipeline project for Vowpal estimators library

Microsoft, PhD Intern, Summer 2021 (Redmond: remote)	2021

- Whitepaper: Fair, private and storage-efficient Telemetry Client-side aggregation
  (mentor: P. Angulo, PhD)

GRADUATE SCHOOL INTERNSHIPS
Autodesk, *PhD Intern, Summer 2020 (Pier 9, San Francisco: remote)*   2020
- *Renyi-Differential Privacy prototyping project for Distributed Databases*

RELEVANT WORK / INDUSTRY EXPERIENCE (Pre-Grad school)
Mercury Banking (Haskell fintech) : *Software Engineering Intern (San Francisco)*   2019
Apple, Inc.: *Software Engineering Intern (Sunnyvale)*   2019
Google Summer of Code: *Developer for Haskell.org*   2018
Mozilla: *Increasing Rust's Reach Developer*   2018

NON-ACADEMIC SERVICE (ABRIDGED)
Invited Finalist Judge, Technovation, AI for Good   2021
Participant, Git Contributors Inclusion Summit   2020
Reviewer, Code2040 Application Essays   2020
Reviewer, OpenMined Differential Privacy articles   2020
Judge, DataKind, Data.org, Inclusive Growth and Recovery Challenge   2020
Google Developer Student Club Lead (for University of Vermont)   2019
Reviewer, Travel Grant Applications, Clojure Conj (2 rounds)   2017

OTHER (NON-INDUSTRY) TALKS (ABRIDGED)
"Compositional Isogeny Schemes", Tapia Doctoral Consortium (45 minutes)   2022
"A Journey through Unboundedness of ranks of Elliptic Curves", (15 minute talk)   2022
Roots of Unity Workshop (joint talk with O. Del Guercio and M. Bustos Gonzalez)
Brown University, Fair February talk on Security, Privacy, Fairness (30 minutes)   2022
Meetup "Math for Math's Sake", Virtual Lightning Talk (10-15 minutes)   2022
"Isogenies, Elliptic Curves and Random Walks on Random Graphs
"Composable Forgetful Isogenies", Google CSRMP Research Alumni Talk (30 minutes) 2022
"Price of Anarchy in Selfish Routing", Google CSRMP Research Alumni Talk (30 minutes) 2022
CS Research Day, "Price of Anarchy in Selfish Routing", UVM (16 min)   2022
ICLR, Main Conference, Opening Remarks by DEI Chairs   2022
- *"Broadening Participation in Research Initiative" (with R. Liu) (5-10 minutes)*
"Composable Forgetful Isogeny Graph Cryptography", Google CSRMP Research   2021
"Isogeny Graph Cryptography",School for Poetic Computation, Re-learning to love Maths 2021
"Isogeny Graph Cryptography", School for Poetic Computation,"Learning to Love Maths" 2021
Invited Panelist, Peer-connected Undergraduate Research Exploration in Computer   2021
and Information Science and Engineering ([PRE.CISE](#)*)*
University of Vermont, CIS196, Privacy Law Research Talk   2021
PLAID Lab speaker, "What Scientists can learn from Artists"   2020
PLAID Lab Speaker, "Information Theory: from Spacecraft to Blockchain"   2021
CS Crew Project talk : contributing to Maths software (CodeWorld, SageMaths)   2019

INDUSTRY TALKS (ABRIDGED)
"Isogeny-Based Cryptography", JP Morgan AI Research Cryptography Group (1 hour)   2022
*"Prediction Sensitivity:Continual Audit of Counterfactual Fairness in Deployed Classifiers"*2022
- *Basis.AI Invited Talk (20 minutes) (New York, NY)*

INDUSTRY TALKS (ABRIDGED)

JP Morgan AI Research Weekly Technical Meeting, (New York) (20 min)	2022
JP Morgan AI Research Reading Group Meeting (30 min)	2022
JP Morgan Summer Symposium (10 min)	2022
Women Who Code: SageMath: "Computational (Pure) Mathematics/Graph Theory"	2022
- *Lightning Talk (2-4 min)*	
"Prediction Sensitivity for Fairness in AI", Jane Street Symposium (15 minutes)	2021
"Renyi-Differential Privacy", Autodesk UX Group (20 minutes)	2020

CLASSES (PhD)

Doctoral Research with advisors C. Vincent and J. Near	2021-present
Combinatorial Graph Theory taught by P. Rombach (Fall 2022)	2022
Graduate Combinatorics (Spectral Graph Theory) taught by P. Rombach (Fall)	
Independent Study: Category Theory taught by A. Patania (Fall)	
Random Probabilistic Graphs, taught by P. Rombach (Spring 2022)	
Abstract Algebra IV A: (Ring & Module Theory, Category Theory) taught by T. Dupuy (Fall)	
Abstract Algebra IV C: (Elliptic Curves & Modular Forms), taught by C. Vincent (Spring)	
Abstract Algebra I taught by P. Rombach (Commutative Group theory) (Fall 2021)	2021
Abstract Algebra III taught by C. Vincent : (Fields, Rings, Galois Theory) (Fall)	
(Post-quantum) Mathematical Cryptography, taught by C. Vincent (Spring 2021)	
Privacy, Law and Policy, taught by R. Kriger (Spring)	2021
Secure Distributed Computation; taught by J. Near using Python (Fall)	2020
Machine Learning; taught by S. Wshah using Python (Spring)	2020
Doctoral Research with advisors J. Near and D. Darais (Spring, Fall)	2019-2020
Data Privacy; taught by J. Near using Python (Fall)	2019
Software Verification; taught by D. Darais using Agda (Fall)	2019
Computer Human Interaction; taught by J. Bongard (Fall)	2019

CLASSES (AUDIT)

UVM: Topology (Point-Set Topology) taught by C. Vincent (Fall)	2022
Theory of Algebraic Differential Equations (Differential Geometry, Lie Algebra),	
taught by T. Dupuy (Fall)	
UVM Elementary Number Theory taught by C. Vincent (Spring)	
Fundamentals of Mathematics taught by T. Dupuy : (writing proofs) (Spring)	
Extremal Graph Theory taught by P. Rombach	2021
Preliminary Arizona Winter School, Model Theory and Applications, taught by R. Nagloo	2022-2023
Stanford: EE 374 : Internet-Scale Consensus in the Blockchain Era (Spring)	2021
- *Information Theory class focused on scalability and protocols in Blockchain*	
- *Taught by D. Tse, PhD through Stanford University*	
- *Audited class, scribed for Lecture 11, Spring 2021*	

OTHER

Arizona Winter School : Intro to Model Theory and Applications (led by R. Nagloo)	2022
UVM: Book club studying HDX and Expander Graphs (with Pure Maths students)	2022-2023
Self-study: Matroids, Polytopes	2022-2023

HACKATHONS

R Data Hackathon 2021, <u>First Place</u>, "Cast and Gender Roles in Movie Data"   *2021*
- *Our group won First place at the R Data Hackathon 2021 for Best Visualization*

Initiative for Cryptocurrencies and Contracts (IC3) Blockchain Bootcamp   *2021*
- *Worked on group project : Fairness consensus for Miner Extractable Value ([MEVs](#))*
- *Implemented Aequitas protocol from [paper](#) with authors for fairness simulation*
- *One of [top four winning teams](#) chosen*

Skills: Python, Sage, Haskell, LaTeX, Matlab, (learning Rust and R), Jupyter, SQL, AWS, PySpark, Sparklyr, Maplesoft, Tensorflow, Git, writing proofs.

PRESS (SELECTED)

Publication Featured in Montreal AI Ethics Institute (MAIEI) newsletter	2022
Publication work Featured in BitMEX Research blog	2022
Also featured / interviewed in articles / media by Coursera, NASA-JPL, Google, Udacity,	2016-present

The MacArthur Foundation, Venture Beat, The Data Standard, Corecursive Podcast, OpenMined,Career Girls, Dataiku, Scott Hanselman's Podcast, BlackComputeHer, NASA Tech Briefs (40th anniversary), Variety, ACM SPLASH 2022 PLMW Perspectives, the Los Angeles Times, Black Girls Code colouring book on Women Scientists, etc.

GUEST WRITER (SELECTED)

[Blogpost](#), **Summer of Bitcoin** (joint with S. Alscher) (Lightning Network routing)	2022
Blog posts, **Harvard Tech X Social Impact Fellowship** (3 articles)	2022

ACADEMIC ASSOCIATION FOR COMPUTING MACHINERY (ACM) MEMBERSHIPS

Student Member, International Association of Cryptologic Research (IACR)	*2020-present*
SIGecom Special Interest Group on Economics and Computation	*2020-present*

NON-ACADEMIC MEMBERSHIP

Student Member, IEEE Computer Society Technical Committee on Security and Privacy	*2021-present*
Member, Women in Number Theory	*2018-present*
Member, QVNTS (Quebec-Vermont Number Theory Seminar)	*2021-present*
Member, Women in Combinatorics	*2021-present*
Member, Association for Women in Mathematics	*2021-present*
Member, She256	*2021-present*
Member, Women in Security and Privacy (WISP)	*2020-present*
Member, IEEE Information Theory Society, Santa Clara Valley Chapter	*2016-present*