

Krystal Maughan

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Research Interests: Differential Privacy, Fairness, Machine Learning

University of Vermont, PhD candidate

2019-present

Differential Privacy, Fairness, Neural Networks

Skills: Haskell, Python, LaTeX, Jupyter, SQL, AWS, PySpark, PyTorch, Tensorflow, Git

RELEVANT WORK EXPERIENCE

Research Assistant, PLAID Lab (Vermont)

2019-present

Supervisors: Joe Near and David Darais: Research on Provable Fairness and Privacy Using Machine Learning. Funded via Amazon Research Fellowship (2020-2022)

Graduate Writing Consultant, Fall 2020 (Vermont)

2020

Writing Mentor and Consultant for graduate students

Technical Writing Consultant for fields as broad as Materials Science to History

Autodesk, Summer 2020 (Pier 9, San Francisco: remote)

2020

Research Intern for Forge Team, Differential Privacy project

Teacher's Assistant, Fall/Spring 2019-2020 (Vermont)

2019-2020

Compiler Construction with Haskell (taught by Joe Near)

2020

Advanced Web Design (taught by Bob Erickson)

Programming with Matlab (taught by Radhakrishna Dasari)

2019

Data Privacy with Jupyter, Python (taught by Joe Near)

Mercury (San Francisco)

2019

Wrote Haskell back-end application for stealth fintech startup as software intern

Used Haskell, Stack, Yesod, Nix, Postgres. Supervised by Max Tagher. (Summer)

Apple, Inc. (Sunnyvale)

2019

Software Intern, Wrote code for Security and Cloud at Scale (Spring)

Google Summer of Code for Haskell.org (remote)

2018

Wrote Debugging tools for CodeWorld¹,

A Google project sponsored by Haskell.org, under

Supervision of Chris Smith (Google) and Gabriel Gonzalez (Awake Security).

Used Haskell, GHCJS, Cabal.

¹ CodeWorld: <https://github.com/google/codeworld/commits?author=kammitama5>

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| Mozilla, Increasing Rust's Reach (remote) | 2018 |
| Worked on Implied Boolean Predicates ² , | |
| For Command line tools in Rust, under Supervision of Aaron Power and Ed Page. | |
| Worked in Rust, used Travis Continuous Integration | |

MERIT-BASED MENTORSHIPS / RESEARCH MENTORSHIPS

| | |
|--|------|
| Mentee, Global Outreach Mentorship with Dr. Swathi Gupta (EC 2020) | 2020 |
| Mentee, LatinX in AI Research Workshop Mentorship with J. Barajas (ICML 2020) | 2020 |
| Mentee, Mentored by Amal Ahmed, (ICFP 2020) | 2020 |
| Mentee, Lighthouse3 AI Ethics Mentoring Externship with F. McEvoy (1 of 20 chosen) | 2020 |
| Mentee, Code2040 Fellowship with Ben Waber | 2020 |

MERIT-BASED GRANTS / SCHOLARSHIPS / FELLOWSHIPS

| | |
|--|------|
| TechX Social Impact / Harvard Franklin Fellowship (1 of 12) | 2020 |
| Participant, Algorithmic Game Theory Mentoring Workshop (AMW) (co-located with EC 2020) | 2020 |
| WiML ICML Travel Funding Grant (sponsor QuantumBlack) | 2020 |
| ALife Student Scholarship Recipient (to attend ALife Conference) | 2020 |
| BRAID Funding to attend Grace Hopper Conference (courtesy of UVM) | 2020 |
| Udacity's Machine Learning Scholarship for Microsoft Azure | 2020 |
| NCWIT Change Leader Scholar (1 of 30 chosen) | 2020 |
| NCWIT Collegiate Award Finalist (1 of 85) | 2019 |
| Code2040 2020 Fellow (1 of 80) | 2019 |
| WiCyS Student Scholarship (Women in Cybersecurity) | 2019 |
| Udacity Technology Scholarship (AI track): Intro to Deep Learning with Pytorch | 2019 |
| Helium Grant (chosen as 1 of 11 out of 700) | 2018 |
| EaRI Career Scholarship, (R Data Science Scholarship) - declined offer | 2018 |
| Udacity Bertelsmann Data Science Scholarship - declined offer | 2017 |
| AT and T Aspire to Tech grant Winner | 2017 |
| 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

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|--|------|
| NCWIT/Bloomberg GHC Conference Grant | 2020 |
| Grace Hopper Conference | 2020 |
| Women of Color in Technology Complimentary Registration | |
| Financial Aid Grant, SciPy (Scientific Computing with Python) | 2020 |
| LXAI+BAI@GTC Nvidia Digital DLI Workshop Scholarship Award for DLI workshop | 2020 |
| "Applications of AI for Anomaly Detection [LDLIW2249] (Deep Learning Institute at GTC) | |
| ICERM (Brown University) Variable Precision in Mathematical & Scientific Thinking | 2020 |
| RWC2020 (Real World Crypto: registration, flight, lodging) Grant via IACR | 2020 |
| CRA-WP Grad Cohort for Women (covers flight, registration, lodging) | 2019 |
| CRA-WP Grad Cohort for Underrepresented Minorities (flight, registration, lodging) | 2019 |
| Neurips Conference Travel Grant (includes free registration) | 2019 |

² Assert Predicates.rs: <https://github.com/assert-rs/predicates-rs/commits?author=kammitama5>
 Assert Cmd.rs: https://github.com/assert-rs/assert_cmd/commits?author=kammitama5

OTHER GRANTS/ FELLOWSHIPS

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| <i>Sage-Days-104 : To work on SageMath Software: Arithmetic Dynamics</i> | 2019 |
| <i>Simons Institute (Berkeley) Error-Correcting Codes and High-Dimensional Expansion Boot Camp (attendee)</i> | 2019 |
| <i>ICERM (Brown University) Encrypted Search Workshop Grant (Lodging provided)</i> | 2019 |
| <i>Cornell Number Theory Conference Grant (Lodging provided)</i> | 2019 |
| <i>MSRI (Mathematical Sciences Research Institute) Grants to attend:</i> | |
| <i>Optimal Transport and applications to machine learning and statistics</i> | 2020 |
| <i>NASA L'Space NPWEE Concept Proposal writing programme participant</i> | 2019 |
| <i>NASA L'Space Proposal/Review Academy (patentable research proposal for funding)</i> | 2019 |
| <i>NASA L'Space Academy (virtual team & mentorship with NASA scientists Level 1)</i> | 2019 |
| <i>Connections for Women:</i> | 2019 |
| <ul style="list-style-type: none">- <i>Derived Algebraic Geometry, Birational Geometry and Moduli Spaces workshop</i>- <i>Introductory Workshop: Derived Algebraic Geometry and Birational Geometry And Moduli Spaces</i> | |
| <i>Racket Summer School (National Science Foundation Grant)</i> | 2018-2019 |
| <i>PLMW (Programming Languages Mentorship Workshop)</i> | 2018 |
| <i>ICFP (International Conference Functional Programming)</i> | |
| <i>PLMW(Programming Languages Mentorship Workshop)</i> | 2018 |
| <i>PLDI (Programming Languages Design and Implementation)</i> | |
| <i>OPLSS (Oregon Programming Languages Summer School Grant) - declined offer</i> | 2018 |

INDUSTRY PhD INVITATIONS

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|---|------|
| <i>Participant, Adobe, "The Future of Creativity" (Virtual)</i> | 2020 |
| <i>Participant, Microsoft Research, Frontiers in Machine Learning (Redmond, remote)</i> | 2020 |
| <i>Participant, Discover Bloomberg: Women in Engineering event (New York, remote)</i> | 2020 |
| <i>Participant, Twitter PhD ML Flock Event (New York, Boston office)</i> | 2019 |

D&I (Diversity and Inclusion) Invitations (Academic Conferences):

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| <i>KDD 2020 D&I Grant (free registration)</i> | 2020 |
| <i>ECCV 2020 (free registration courtesy Google Research)</i> | 2020 |

Developer Conference Grant/ Scholarship Invitations (Non-Academic Conferences):

AppSec (LA) 2019, TechTogetherBoston 2020, Twilio's Signal Conf 2019, Curry On! 2019, RustConf 2018, LambdaConf 2017/2018, Strange Loop 2017, Software Craftsmanship North America (SCNA), Clojure Conj 2016/2017, Clojure West 2017, Chrome Dev Summit 16-18, Google IO 2016-2019

ACADEMIC REVIEWER

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|---|------|
| <i>Reviewer and Programme Committee Member, LXAI@ICML Workshop</i> | 2020 |
| <i>Committee Reviewer, HCI Track, GHC (Grace Hopper Conference)</i> | 2020 |
| <i>Chair Reviewer, PML4DC (Practical ML for Developing Countries) workshop, ICLR (International Conference on Learning Representations)</i> | 2020 |
| <i>Reviewer, Tapia Conference (Panels and Workshops)</i> | 2020 |
| <i>Reviewer, Travel Grant Applications, Black in AI for AAAI (Association for the Advancement of Artificial Intelligence)</i> | 2020 |
| <i>Reviewer, Travel Grant Applications, Clojure Conj (2 rounds)</i> | 2017 |

ACADEMIC SERVICE (AI/Machine Learning)

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| <i>Black in AI Logistics Co-Chair (NeurIPS)</i> | 2020 |
| <i>WiML Senior Program and Mentorship Co-Chair, WiML (NeurIPS)</i> | 2020 |
| <i>Session Facilitator, ICML 2020 for “Recommender System Research in Industry” (1 of 2)</i> | 2020 |
| <i>Volunteer ACL (Association of Computational Linguistics)</i> | 2020 |
| <i>Co-organizer, ACL (Association of Computational Linguistics) Black in AI Socials</i> | 2020 |
| <i>Volunteer, ICML 2020 (International Conference on Machine Learning)</i> | 2020 |
| <i>Volunteer, EC’20 (Economics and Computation)</i> | 2020 |
| <i>Volunteer, ICLR (International Conference on Learning Representations)</i> | 2020 |
| <i>Member, MD4SG (Mechanism Design for Social Good); Education working group</i> | 2020 |
| <i>Member, MD4SG Data and Governance working group</i> | 2020 |
| <i>Chair, AAAI Black in AI Annual Lunch</i> | 2020 |
| <i>Panelist, AAAI Try AI Workshop</i> | 2020 |
| <i>Invited Panelist, CRAFT workshop, FAT* conference (declined offer)</i> | 2020 |

ACADEMIC JOURNALS (AI/Machine Learning)

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|--|------|
| <i>Board Member, AI and Ethics, Springer</i> | 2020 |
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ACADEMIC SERVICE (Other)

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| <i>Student Volunteer, ICFP (International Conference Functional Programming)</i> | 2020 |
| <i>Student volunteer, ICFP (International Conference Functional Programming)</i> | 2018 |
| <i>Student volunteer, PLDI (Programming Languages Design and Implementation)</i> | 2018 |
| <i>Student volunteer, POPL (Principles of Programming Languages)</i> | 2018 |
| <i>Student volunteer, SPLASH</i> | 2018 |
| <i>(Systems, Programming, Languages, and Applications) (declined offer)</i> | |

NON-ACADEMIC SERVICE

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| <i>Reviewer, Code2040 Application Essays</i> | 2020 |
| <i>Reviewer, OpenMined Differential Privacy articles</i> | 2020 |
| <i>Judge, DataKind, Data.org, Inclusive Growth and Recovery Challenge</i> | 2020 |
| <i>Google Developer Student Club Lead (for University of Vermont)</i> | 2019 |

RESEARCH TALKS & POSTER PRESENTATIONS

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|---|------|
| <i>Poster Presentation, 4th MD4SGD 2020 Annual Proceedings</i> | 2020 |
| <i>“Towards a Measure of Individual Fairness for Deep Learning” (first author)</i> | |
| <i>Poster Presentation, Carnegie Mellon’s (CMU) AI for Social Good Symposium</i> | 2020 |
| <i>“Examining Implicit Bias in Police Data: Lessons Learned about Reproducibility And Transparency in AI”</i> | |
| <i>“Towards a Measure of Individual Fairness for Deep Learning” ;</i> | 2020 |
| <i>Short Presentation given for UVM/CS++ Research Day (20 min talk)</i> | |
| <i>“Personalized Robotic Control using MISL” for UVM/CS++ Research Day (20 min talk)</i> | 2019 |

GRANT WRITING / PROPOSALS

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|---|------|
| <i>CDS&E Computational and Data-Enabled Science and Engineering</i> | 2020 |
| <i>Database Grant Proposal for SageMaths (as Key Personnel) (PI Ben Hutz)</i> | |

WRITING / PUBLICATIONS / POSTS

| | |
|---|------|
| Contributor, Wikipedia: WikiProject Women in Red/AI Ethics | 2020 |
| Tech X Social Impact " Impossible Markets and Big Dreams : My interaction with the COO of Impossible Foods" | 2020 |
| Tech X Social Impact " Ready! Start: Exploring the Virtual Healthcare Multiverse " | 2020 |
| Google Summer of Code " Breaking the Time-Space Barrier with Haskell " | 2018 |

PRESS

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| VentureBeat "AI needs systemic solutions to systemic bias, injustice and inequality" | 2020 |
| Featured by Women of Silicon Valley, June Edition "16 Caribbean Techies" | 2020 |
| Featured by Women of Silicon Valley, May Edition | 2020 |
| Interviewed for CareerGirls.org Boston (videographed at MIT) | 2019 |
| Featured by Coursera (Learner Story) | 2017 |

INDUSTRY TALKS

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|---|------|
| Speaker, EGG on Air Conference (human-centred AI) | 2020 |
| Presenter, VentureBeat's Transform 2020 Wrap-up for panel on Ethics and AI | 2020 |
| Moderator, VentureBeat's Transform 2020 panel on Ethics and AI | 2020 |
| Interviewed for Podcast, Women of Silicon Valley | 2020 |
| Invited Panelist, Career Girls AI Virtual Camp | 2020 |
| Invited Speaker, Autodesk Design (Boston Office) on Differential Privacy | 2020 |
| Invited Speaker, Sister to Sister International, Inc (STSI) on AI, Privacy, Ethics | 2020 |
| Invited Panelist, Morehouse@Momentum Coding School, "The Data Don't Lie" | 2020 |
| Invited Guest, Corecursive Podcast (Technical Podcast) | 2020 |
| Women in Data Science talk "Why conferences matter" (40 min NeurIPS inspired talk) | 2020 |
| "Magic Gnomes: A GHC Compiler talk (5-minute talk at Github for Sentry's Show & Tell) | 2019 |
| "Denotational Semantics" (2 minute Lightning Talk for Meetup group) | 2018 |
| "Recap of Google I/O 2018" (20 minute presentation at Google Developer Group LA) | 2018 |

OTHER (NON-INDUSTRY) TALKS

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|--|------|
| CS Crew Project talk : contributing to Maths software (CodeWorld, SageMaths) | 2019 |
| CS Crew GSoC talk (40-minute talk about Google Summer of Code and Internships) | 2019 |
| CS293 Technical Interviewing Workshop Talk | 2019 |

CLASSES (PhD)

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|---|------|
| Secure Computation; taught by Joe Near using Python (Fall) | 2020 |
| Machine Learning; taught by Safwan Wshah using Python (Spring) | |
| Doctoral Research with advisors Joe Near and David Darais (Spring, Fall) | |
| Software Verification; taught by David Darais using Agda (Fall) | 2019 |
| Data Privacy; taught by Joe Near using Python (Fall) | |
| Computer Human Interaction; taught by Josh Bongard (Fall) | |
| Full Cohort Participant (1 of 18), "Dark Matters", School for Poetic Computation (taught by American Artist : workshop on Surveillance, data, ethics, history of Silicon Valley; guests included Dr. Simone Browne, Stephanie Dinkins and Rashida Richardson) | 2020 |

ONLINE LEARNING (SELECTED)

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|---|------|
| <i>Stanford ICME Summer NLP in Deep Learning Workshop</i> | 2020 |
| <i>Participant, IBM Qiskit Global Quantum Computing Summer School</i> | 2020 |
| <i>Participant, PL+HCI Swimmer Summer School</i> <i>(Programming Languages + Human Computer Interaction)</i> | 2020 |
| <i>Participant, MSRI, Decidability, Definability and Computability in Number Theory</i> | 2020 |
| <i>DeepLearning.ai</i> | 2020 |
| <ul style="list-style-type: none">- <i>Neural Networks and Deep Learning</i>- <i>Improving Deep Neural Networks: Hyperparameter Regularization and Optimization</i>- <i>Structuring Machine Learning Projects</i> | |
| <i>Hyperlink Academy</i> | 2020 |
| <ul style="list-style-type: none">- <i>The Book is a Program 0 (Publishing a book in Racket)</i>- <i>GUIs through Art History 0 (Recreating Periods of Art in History using GUIs)</i> | |
| <i>FutureLearn</i> | |
| - <i>"Empire: The Controversies of British Imperialism"</i> | 2020 |
| - <i>The Laws of Digital Data, Content and Artificial Intelligence</i> | 2020 |
| - <i>"Functional Programming in Haskell"</i> | 2017 |