

# Krystal Maughan

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*Research Interests: Differential Privacy, Fairness, Machine Learning*

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## **University of Vermont, PhD candidate**

**2019-present**

*Differential Privacy, Fairness, Neural Networks*

**Skills:** Haskell, Python, LaTeX, Jupyter, PySpark, PyTorch, Tensorflow, Git

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## **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*

### **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 CodeWorld<sup>1</sup>,*

*A Google project sponsored by Haskell.org, under*

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

*Used Haskell, GHCJS, Cabal.*

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

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

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### **MERIT-BASED RESEARCH MENTORSHIPS**

<i>Mentee, Global Outreach Mentorship with Dr. Swathi Gupta (EC 2020)</i>	2020
<i>Mentee, LatinX in AI Research Workshop Mentorship with J. Barajas (ICML 2020)</i>	2020
<i>Mentee, Lighthouse3 AI Ethics Mentoring Externship with F. McEvoy (1 of 20 chosen)</i>	2020

### **MERIT-BASED GRANTS / SCHOLARSHIPS / FELLOWSHIPS**

<i>Participant, Algorithmic Game Theory Mentoring Workshop (AMW) (co-located with EC 2020)</i>	2020
<i>ALife Student Scholarship Recipient (to attend ALife Conference)</i>	2020
<i>BRAID Funding to attend Grace Hopper Conference (courtesy of UVM)</i>	2020
<i>NCWIT Change Leader Scholar (1 of 30 chosen)</i>	2020
<i>NCWIT Collegiate Award Finalist (1 of 85)</i>	2019
<i>Code2040 2020 Fellow (1 of 80)</i>	2019
<i>WiCyS Student Scholarship (Women in Cybersecurity)</i>	2019
<i>Udacity Technology Scholarship (AI track): Intro to Deep Learning with Pytorch</i>	2019
<i>Helium Grant (chosen as 1 of 11 out of 700)</i>	2018
<i>EaRI Career Scholarship, (R Data Science Scholarship) - declined offer</i>	2018
<i>Udacity Bertelsmann Data Science Scholarship - declined offer</i>	2017
<i>AT and T Aspire to Tech grant Winner</i>	2017
<i>NCAS Workshop participant (NASA Community College Aerospace Scholars)</i>	2016
<i>Who's Who/ Peggy Williams Memorial Scholarship/ Best BFA Award (Best of Major)</i>	2008

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### **OTHER GRANTS/ FELLOWSHIPS**

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

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<sup>2</sup> 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](https://github.com/assert-rs/assert_cmd/commits?author=kammitama5)

## **OTHER GRANTS/ FELLOWSHIPS**

NASA L'Space Proposal/Review Academy (patentable research proposal for funding)	2019
NASA L'Space Academy (virtual team & mentorship with NASA scientists Level 1)	2019
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

## **INDUSTRY PhD INVITATIONS**

Participant, Discover Bloomberg: Women in Engineering event (New York, remote)	2020
Participant, Twitter PhD ML Flock Event (New York, Boston office)	2019

## **Developer Conference Grants to attend:**

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

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## **REVIEWER**

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 (International Conference on Learning Representations)	2020
Reviewer, Tapia Conference (Panels and Workshops)	2020
Reviewer, Travel Grant Applications, Black in AI for AAAI (Association for the Advancement of Artificial Intelligence)	2020
Reviewer, Travel Grant Applications, Clojure Conj (2 rounds)	2017

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## **SERVICE (AI/Machine Learning)**

WiML Senior Program and Mentorship Co-Chair, WiML (NeurIPS)	2020
Volunteer ACL (Association of Computational Linguistics)	2020
Volunteer, ICML 2020 (International Conference on Machine Learning)	2020
Volunteer, EC'20 (Economics and Computation)	2020
Volunteer, ICLR (International Conference on Learning Representations)	2020
Member, MD4SG (Mechanism Design for Social Good); Education working group	2020
Chair, AAAI Black in AI Annual Lunch	2020
Panelist, AAAI Try AI Workshop	2020
Invited Panelist, CRAFT workshop, FAT* conference (declined offer)	2020

## **SERVICE (Other)**

Student Volunteer, ICFP (International Conference Functional Programming)	2020
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## **SERVICE (Other)**

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	2018
(Systems, Programming, Languages, and Applications) (declined offer)	
Google Developer Student Club Lead (for University of Vermont)	2019

## **RESEARCH TALKS & POSTER PRESENTATIONS**

Carnegie Mellon's (CMU) AI for Social Good Symposium (poster, 2 min talk)	2020
"Personalized Robotic Control using MISL" for UVM/CS++ Research Day (20 min talk)	2019

## **WRITING / PUBLICATIONS / POSTS**

Technical Writer, OpenMined Writing Team (technical articles on Deep Learning And Differential Privacy)	2020
Google Summer of Code " <a href="#">Breaking the Time-Space Barrier with Haskell</a> "	2018

## **PRESS**

Featured by Women of Silicon Valley, May Edition	2020
Interviewed for CareerGirls.org Boston (videographed at MIT)	2019
Featured by Coursera (Learner Story)	2017

## **FUNDRAISING / GRANT WRITING**

e-Kaggle Days, Responsible for securing approx \$20,000 in sponsorship funds	2020
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## **INDUSTRY TALKS**

Invited Panelist, Career Girls AI Virtual Camp	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
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)**

Secure Computation; taught by Joe Near using Python (Fall)	2020
Numerical Analysis; taught by Chris Danforth (Fall)	
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)	

**CLASSES (RELATED)**

*Full Cohort Participant (1 of 18), "Dark Matters", School for Poetic Computation* 2020  
*(taught by American Artist : workshop on Surveillance, data, ethics, history of Silicon Valley; guests included Dr. Simone Browne)*

**ONLINE LEARNING (SELECTED)**

*DeepLearning.ai* 2020

- *Neural Networks and Deep Learning*
- *Improving Deep Neural Networks: Hyperparameter Regularization and Optimization*
- *Structuring Machine Learning Projects*

*FutureLearn*

*"Empire: The Controversies of British Imperialism"* 2020

*"Functional Programming in Haskell"* 2017