

# Krystal Maughan

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

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<b>University of Vermont, PhD candidate</b>	<b>2019-present</b>
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*Differential Privacy, Fairness, Neural Networks*

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

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<b>Research Assistant, PLAID Lab (Vermont)</b>	<b>2019-present</b>
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*Supervisors: Joe Near and David Darais: Research on Provable Fairness and Privacy Using Machine Learning. Funded via Amazon Research Fellowship (2020-2022)*

<b>Research Assistant, PLAID Lab (Vermont)</b>	<b>2020</b>
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*Supervisors: Joe Near and Swati Gupta: Research on Participatory Fairness*

<b>Research Intern, Autodesk Summer 2020 (Pier 9, San Francisco: remote)</b>	<b>2020</b>
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*Research Intern for Forge Team, Differential Privacy project*

<b>Graduate Writing Consultant, Fall 2020 (Vermont)</b>	<b>2020</b>
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*Writing Mentor and Consultant for graduate students*

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

<b>Teacher's Assistant, Fall/Spring 2019-2020 (Vermont)</b>	<b>2019-2020</b>
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*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)*

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## RELEVANT WORK EXPERIENCE

<b>Mercury:</b> Software Engineering Intern (San Francisco)	2019
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<b>Apple, Inc.:</b> Software Engineering Intern (Sunnyvale)	2019
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<b>Google Summer of Code:</b> Developer for Haskell.org (remote)	2018
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<b>Mozilla:</b> Increasing Rust's Reach Developer (remote)	2018
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## RESEARCH TALKS & POSTER PRESENTATIONS

Poster Presentation, 4th MD4SGD 2020 Annual Proceedings	2020
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*"Towards a Measure of Individual Fairness for Deep Learning" (first author)*

Poster Presentation, Carnegie Mellon's (CMU) AI for Social Good Symposium	2020
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*"Examining Implicit Bias in Police Data: Lessons Learned about Reproducibility And Transparency in AI"*

## **RESEARCH TALKS & POSTER PRESENTATIONS**

<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

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

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

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

<i>TechX Social Impact / Harvard Franklin Fellowship (1 of 12)</i>	2020
<i>Participant, Algorithmic Game Theory Mentoring Workshop (AMW)</i>	2020
<i>(co-located with EC 2020)</i>	
<i>WiML ICML Travel Funding Grant</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>Udacity's Machine Learning Scholarship for Microsoft Azure</i>	2020
<i>NCWIT Change Leader Scholar (1 of 30)</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

## **OTHER GRANTS/ FELLOWSHIPS**

<i>Grace Hopper Conference</i>	2020
<i>Women of Color in Technology Complimentary Registration</i>	
<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</i>	2019
<i>Expansion Boot Camp (attendee)</i>	

**OTHER GRANTS/ FELLOWSHIPS**

<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>Connections for Women:</i>	2019
- <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>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 &amp; mentorship with NASA scientists Level 1)</i>	2019
<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

**ACADEMIC REVIEWER**

<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</i>	2020
<i>Reviewer, Tapia Conference (Panels and Workshops)</i>	2020
<i>Reviewer, Travel Grant Applications, Black in AI for AAAI</i>	2020
<i>Reviewer, Travel Grant Applications, Clojure Conj (2 rounds)</i>	2017

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

<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>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)**

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

<i>Student Volunteer, ICFP (International Conference Functional Programming)</i>	2020
<i>Student volunteer, ICFP (International Conference Functional Programming)</i>	2018

## **ACADEMIC SERVICE (Other)**

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)	

## **NON-ACADEMIC SERVICE**

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

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## **GRANT WRITING / PROPOSALS**

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

## **WRITING / PUBLICATIONS / POSTS**

Tech X Social Impact " <a href="#">Ready! Start: Exploring the Virtual Healthcare Multiverse</a> "	2020
Google Summer of Code " <a href="#">Breaking the Time-Space Barrier with Haskell</a> "	2018

## **INDUSTRY PhD INVITATIONS**

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

## **PRESS**

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**

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

## **INDUSTRY TALKS**

*“Recap of Google I/O 2018” (20 minute presentation at Google Developer Group LA)* 2018

## **OTHER (NON-INDUSTRY) TALKS**

*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

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

*KDD 2020 D&I Grant (free registration)* 2020

*ECCV 2020 (free registration courtesy Google Research)* 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*

## **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)**

*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, Stephanie Dinkins and Rashida Richardson)*

## **ONLINE LEARNING (SELECTED)**

*Stanford ICME Summer NLP in Deep Learning Workshop* 2020

*Participant, IBM Qiskit Global Quantum Computing Summer School* 2020

*Participant, PL+HCI Swimmer Summer School* 2020

*(Programming Languages + Human Computer Interaction)*

*Participant, MSRI, Decidability, Definability and Computability in Number Theory* 2020

*DeepLearning.ai* 2020

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

## **ONLINE LEARNING (SELECTED)**

### *Hyperlink Academy*

2020

- *The Book is a Program 0 (Publishing a book in Racket)*
- *GUIs through Art History 0 (Recreating Periods of Art in History using GUIs)*

### *FutureLearn*

- *“Empire: The Controversies of British Imperialism”* 2020
- *The Laws of Digital Data, Content and Artificial Intelligence* 2020
- *“Functional Programming in Haskell”* 2017