# Mo Tiwari

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## EDUCATION:

**Stanford University**, Stanford, CA                    ***GPA: 4.2+***      2017 – Present
Ph.D. in Computer Science
*Advisor: Sebastian Thrun*
*Received over **$700,000** in fellowships and **$150,000** in grants*

M.S. in Computer Science (completed during Ph.D.)      ***GPA: 4.2+***      June 2019

**California Institute of Technology**, Pasadena, CA      ***GPA: 4.0+***      2010 – 2013
*Top **5%** of Graduating Class*

B.S. in Mathematics with Honors                          ***GPA: 4.0+***      June 2013
B.S. in Physics with Honors                              ***GPA: 4.0+***      June 2013

**Columbia University** – **Columbia College**, New York, NY   ***GPA: 4.0+***   2009 – 2010

## INDUSTRY EXPERIENCE:

**SOFTWARE ENGINEER, TECHNICAL LEAD – FACEBOOK, INC.**          2015 – 2017
- Technical lead of the team building ThreatExchange, Facebook's platform for sharing cybersecurity information
- Led product and feature development through 5 major releases that grew the number of enterprise customers from 92 to 500+
- Managed 3 interns who received and accepted fulltime offers

**SECURITY RESEARCH SCIENTIST – EXPANSE, INC. (acquired for $800MM)**  2014 – 2015
- As fifth fulltime employee, performed the first systematic, continuous, and Internet-scale capture and analysis of device data and security vulnerabilities
- Built backend and frontend infrastructure to help analysts understand terabytes of prostitution advertisements and uncover human trafficking
- Work indirectly led to arrests of human traffickers and rescue of victims

**RESEARCHER – DRW TRADING GROUP**                             Summer 2013
- Created valuation models for various financial instruments, such as interest rate swaps and swaptions

**RESEARCHER – JOHN PRESKILL GROUP**                           2011 – 2012
- Proved that a certain class of quantum systems would never function as a form of quantum storage, eliminating their viability in a quantum computer
- Advised by Prof. John Preskill, Dr. Spiros Michalakis, Dr. Jeongwan Haah at Caltech

**RESEARCHER – LARGE HADRON COLLIDER (LHC)**                    Summer 2010
- Analyzed the first data from the Compact Muon Solenoid (CMS) experiment at the LHC, where the Higgs Boson was later discovered
- Discovered and corrected experimental defects by analyzing Missing Transverse Energy to calibrate experimental setups
- Later received admission to the Ph.D. program in Physics at MIT to continue research on this experiment

**RESEARCHER – YORKTOWN HIGH SCHOOL**                    2007 – 2009
- Developed an assistive aid to help patients with physical disabilities complete exercises
- Device led to an 80% increase in patients' exercise completion rate and a 34% decrease in recovery time
- Won third place in category internationally at Intel ISEF 2009

## PUBLICATIONS:

- **Mo Tiwari**, Ryan Kang*, Je-Yong Lee*, Chris Piech, Ilan Shomorony, Sebastian Thrun, Martin Zhang. "MABSplit: Faster Forest Training Using Multi-Armed Bandits." *In submission. Preprint available upon request.*

- Kausthubh D. Dhole, …, **Mo Tiwari**, …, Yue Zhang (122 authors). "NL-Augmenter: A Framework for Task-Sensitive Natural Language Augmentation." https://arxiv.org/abs/2112.02721. *In submission.*

- Aarohi Srivastava, …, **Mo Tiwari**, …, Ziyi Wu (444 authors, listed alphabetically). "Beyond the Imitation Game: Quantifying and Extrapolating the Capabilities of Language Models." https://github.com/google/BIG-bench/. *In submission.*

- Yoshua Bengio, Tristan Deleu, Edward Hu, Salem Lahlou, **Mo Tiwari**, Emmanuel Bengio. "GFlowNet Foundations." https://arxiv.org/abs/2111.09266. *In submission.*

- Ali Mohsen, **Mo Tiwari**. "Image Compression and Classification Using Qubits and Quantum Deep Learning." https://arxiv.org/abs/2110.05476. *In submission.*

- **Mo Tiwari**, Martin Zhang, James Mayclin, Sebastian Thrun, Chris Piech, Ilan Shomorony. "BanditPAM: Almost Linear Time *k*-medoids Clustering via Multi-Armed Bandits." *Neural Information Processing Systems* **(NeurIPS)** *2020.*

- **Mo Tiwari**, …, Charles C. Lin (13 authors). "Differentiation of Active Corneal Infections from Healed Scars Using Deep Learning." *Journal paper in Ophthalmology.* **Best Poster Award** *at associated conference, American Academy of Ophthalmology (AAO) 2020.*

- Serhat Arslan, **Mo Tiwari**, Chris Piech. "Using Google Search Trends to Estimate Global Patterns in Learning." *ACM Learning @ Scale* **(L@S)** *2020.*

## OPEN SOURCE CONTRIBUTIONS:

- **BanditPAM:** https://github.com/ThrunGroup/BanditPAM. **Primary author, 240+ stars.** A high-performance Python package written in C++ that implements the algorithm from our NeurIPS 2020 paper and is `pip`-installable via `pip install banditpam`.

## TEACHING AND MENTORSHIP:

- *Course Assistant for Client-Side Technologies (CS193C)*: Graded assignments, provided feedback, and answered questions for over 100 students each quarter during the summers of 2020 and 2021. Recruited top students for research projects.
- **EDGE Mentor:** Mentored three early Ph.D. students in Computer Science at Stanford University.
- **Ph.D. Student Mentor:** Formally mentored over a dozen undergraduate, M.S., and junior Ph.D. students at Stanford University. Upward performance reviews available upon request.

## INVITED TALKS:

- **Highlights of Algorithms 2021 (HALG21) Conference\***: "BanditPAM: Almost Linear Time *k*-Medoids Clustering via Multi-Armed Bandits."
- **U.S. Food and Drug Administration\*:** "An Introduction to Clustering, Multi-armed Bandits, and BanditPAM."
- **Twitch\*:** "Novel Data Augmentation, Multi-Armed Bandits, and more: New Machine Learning Techniques for Twitch Safety."
- **C3.ai:** "*k*-medoids Clustering and Multimodal Data Augmentation."
- **Facebook:** "ThreatExchange v2.8 Webinar." Joint presentation. https://www.youtube.com/watch?v=SVVC4ZLYHmk
- **Microsoft Security Research Alliance:** "Tracking Advanced Persistent Threats with ThreatExchange." Joint presentation.

*\* denotes a virtual talk*

## ACADEMIC HONORS:

- Stanford Center for Open and Reproducible Science Innovator Prize     2021
  - 1 of 2 University-wide inaugural awardees
- Stanford Interdisciplinary Graduate Fellowship (SIGF)     2020 – 2023
  - Full funding for the Ph.D. for 3 years
  - 1 of 33 graduate student awardees, University-wide, in cohort
  - 1 of 295 awardees since award inception in 2008
- J.P. Morgan AI Research Ph.D. Fellowship     2020
- Oak Ridge Institute for Science and Education (ORISE) Fellowship     2019 – Present
- UnifyID Fellow (Declined)     2018
- Pear VC Fellow     2017 – Present
- NSF Graduate Research Fellowship Program Honorable Mention     2013
- Caltech Summer Undergraduate Research Fellowship (SURF)     2011, 2012
- IBM T.J. Watson Memorial Scholarship     2009 – 2012
- Caltech - San Pietro Travel Prize Recipient     2011
- I. I. Rabi Scholarship     2009 – 2010
- Intel International Science and Engineering Fair (ISEF) - Third place     2009