

Mo Tiwari

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EDUCATION:

Stanford University , Stanford, CA <u>Ph.D.</u> in Computer Science <i>Thesis: “Accelerating Machine Learning Algorithms with Adaptive Sampling”</i> <i>Areas: deep learning, multi-armed bandits, randomized algorithms</i> <i>Advisors: Sebastian Thrun and Chris Piech</i> <i>Received over \$800,000 in fellowships</i>	GPA: 4.2+	2017 – 2023
<u>M.S.</u> in Computer Science (completed during Ph.D.)	GPA: 4.2+	June 2019
California Institute of Technology , Pasadena, CA <i>Top 5% of Graduating Class (Top 15 students)</i>	GPA: 4.0+	2010 – 2013
<u>B.S.</u> in Mathematics with Honors	GPA: 4.0+	June 2013
<u>B.S.</u> in Physics with Honors	GPA: 4.0+	June 2013
Columbia University – Columbia College , New York, NY	GPA: 4.0+	2009 – 2010

RECENT INDUSTRY EXPERIENCE:

MEMBER OF TECHNICAL STAFF – OPENAI, INC. <ul style="list-style-type: none">Under NDA. Sorry!	2024 – Present
SOFTWARE ENGINEER, TECHNICAL LEAD – FACEBOOK, INC. <ul style="list-style-type: none">Technical lead of the team building ThreatExchange, Facebook’s platform for sharing cybersecurity informationLed 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	2015 – 2017
SECURITY RESEARCH SCIENTIST – EXPANSE, INC. (acquired for \$800MM) <ul style="list-style-type: none">As the fifth fulltime employee, performed the first systematic, continuous, and Internet-scale capture and analysis of device data and security vulnerabilitiesBuilt backend and frontend infrastructure to help analysts understand terabytes of prostitution advertisements and uncover human traffickingWork indirectly led to arrests of dozens of human traffickers and rescue of victims	2014 – 2015

SELECTED PUBLICATIONS:

- **Mo Tiwari**, Ryan Kang*, Je-Yong Lee*, Luke Lee*, Chris Piech, Ilan Shomorony, Sebastian Thrun, Martin Zhang. “Faster Maximum Inner Product Search in High Dimensions.” [International Conference on Machine Learning \(ICML\)](#) 2024.
- **Mo Tiwari***, Colin Sullivan*, Sebastian Thrun. “MAPTree: Beating ‘Optimal’ Decision Trees with Bayesian Decision Trees.” [AAAI Conference on Artificial Intelligence \(AAAI\)](#) 2024.
Selected for Oral Presentation: top 9.5% / 2.3% of accepted / submitted papers
- **Mo Tiwari**, Ryan Kang, Luke Lee, Sebastian Thrun, Ilan Shomorony, Martin Zhang. “BanditPAM++: Faster k -medoids Clustering.” [Neural Information Processing Systems \(NeurIPS\)](#) 2023.
- **Mo Tiwari***, Guy Blanc*, Jane Lange*, Chirag Pabbaraju*, Colin Sullivan*, Li-Yang Tan* (listed alphabetically). “Harnessing the Power of Choices in Decision Tree Learning.” [Neural Information Processing Systems \(NeurIPS\)](#) 2023.
- Aarohi Srivastava, ..., **Mo Tiwari**, ..., Ziyi Wu (444 authors, listed alphabetically). “Beyond the Imitation Game: Quantifying and Extrapolating the Capabilities of Language Models.” [Transactions on Machine Learning Research \(TMLR\)](#) 2023.
- Yoshua Bengio*, Salem Lahlou*, Tristan Deleu*, Edward Hu, **Mo Tiwari**, Emmanuel Bengio. “GFlowNet Foundations.” [Journal of Machine Learning Research \(JMLR\)](#) 2023.
- Kausthubh D. Dhole, ..., **Mo Tiwari**, ..., Yue Zhang (122 authors). “NL-Augmenter: A Framework for Task-Sensitive Natural Language Augmentation.” [Northern European Journal of Language Technology \(NEJLT\)](#) 2023.
- **Mo Tiwari**, Ryan Kang, Je-Yong Lee, Chris Piech, Ilan Shomorony, Sebastian Thrun, Martin Zhang. “MABSplit: Faster Forest Training Using Multi-Armed Bandits.” [Neural Information Processing Systems \(NeurIPS\)](#) 2022.
- Qi Liu, ..., **Mo Tiwari**, ..., Shiew-Mei Huang (13 authors). “Landscape Analysis of the Application of Artificial Intelligence and Machine Learning in Regulatory Submissions for Drug Development from 2016 to 2021.” [Clinical Pharmacology and Therapeutics](#) 2022.
- **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/motiwari/BanditPAM>. **Primary author, 600+ 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 Internet Technologies (CS 193C):** 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 through a formal, funded appointment.
- **Ph.D. Student Mentor:** Managed over a dozen undergraduate, M.S., and junior Ph.D. students at Stanford University. Upward reviews available upon request.

ADDITIONAL RESEARCH EXPERIENCE:

RESEARCHER – JOHN PRESKILL GROUP

2011 – 2012

- With Prof. John Preskill, Dr. Spiros Michalakis, Dr. Jeongwan Haah at Caltech, proved that a certain class of quantum systems would never function as a form of quantum storage, eliminating their viability in a quantum computer

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

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. [Youtube](#).
- **Microsoft Security Research Alliance:** "Tracking Advanced Persistent Threats with ThreatExchange." Joint presentation.

ACADEMIC HONORS:

- Stanford Data Science Scholarship 2022 – 2024
 - 1 of 16 graduate student awardees, University-wide, in cohort
 - 1 of 71 awardees since award inception in 2018
- 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