AMAN AGARWAL

415-341-5004 • aa2398@cornell.edu • www.cs.cornell.edu/~aman/ • Cornell University

EDUCATION

Cornell University
2016 - present
PhD in Computer Science
Advisor: Professor Thorsten Joachims
Focus in machine learning: partial-information settings including learning from logged bandit feedback, unbiased learning-to-rank for information retrieval, and causal inference

California Institute of Technology
2012 - 2016
BS in Computer Science
*Significant Coursework in Mathematics***
GPA: 4.0
*** Completed all but 2 courses toward BS in Mathematics*

GRADUATE RESEARCH

August 2016 - present

- A. Agarwal, I. Zaitsev, X. Wang, C. Li, M. Najork, T. Joachims. **Estimating Position Bias without Intrusive Interventions**. WSDM 2019.
  A. Agarwal, I. Zaitsev, T. Joachims. Consistent Position Bias Estimation without Online Interventions for Learning-to-Rank. ICML 2018 CausalML Workshop.
  Z. Fang, A. Agarwal, T. Joachims. Intervention Harvesting for Context-Dependent Examination-Bias Estimation. NeurIPS 2018 Causal Learning Workshop.
  Consistent position bias estimation from user logs generated by multiple rankers without additional interventions or relevance modeling assumptions.

- Z. Fang, A. Agarwal, T. Joachims. **Intervention Harvesting for Context-Dependent Examination-Bias Estimation.** SIGIR 2019.
  Follow-up work for position bias dependent on context such as query features.

- A. Agarwal, X. Wang, C. Li, M. Bendersky, M. Najork. **Addressing Trust Bias for Unbiased Learning-to-Rank.** WWW 2019.
  Extension of the simple model with position-dependent noise in relevance judgments, estimated via EM, and used for unbiased LTR via a novel objective based on inverse propensity scoring and Bayes' rule.

- A. Agarwal, I. Zaitsev, T. Joachims. **A General Framework for Counterfactual Learning-to-Rank.** SIGIR 2019.
  A. Agarwal, I. Zaitsev, T. Joachims. Counterfactual Learning-to-Rank for Additive Metrics and Deep Models. ICML 2018 CausalML Workshop.
  A. Agarwal, I. Zaitsev, T. Joachims. Counterfactual Learning-to-Rank for Optimizing DCG. WSDM 2018 Task IR Workshop.
  Generalization of the counterfactual approach to metrics such as DCG, with both linear SVM and neural net based learning methods. The linear SVM formulation reduces to repeated Ranking SVMs via the Convex Concave Procedure.

- A. Agarwal, S. Basu, T. Schnabel, T. Joachims. **Effective Evaluation using Logged Bandit Feedback from Multiple Loggers.** KDD 2017.
  Unbiased estimators for off-policy evaluation with provably lower variance than direct inverse propensity scoring.

- Y. Su, A. Agarwal, T. Joachims. **Learning from Logged Bandit Feedback of Multiple Loggers**. ICML 2018 CausalML Workshop.
  Follow-up work on developing learning methods using the lower variance unbiased off-policy estimators.

- A. Agarwal, X. Wang, C. Li, M. Bendersky, M. Najork. **Comparison of Ranking Functions using Randomized Data.** RecSys 2018 REVEAL Workshop.
  Matching and interleaving based methods for comparing ranking functions with greater statistical efficiency than direct matching.

INDUSTRY EXPERIENCE

Google AI (Research & Machine Intelligence), *ML Researcher* *May 2018 - August 2018*

- Worked with Xuanhui Wang and Marc Najork on learning-to-rank from click logs for search applications in Gmail and Drive. Trust project improved metrics in **live experiments**, initiating **production launch** process, accepted at WWW 2019. Propensity project yielded offline estimates comparable to online randomized interventions, better and significantly faster (hours/days to minutes) estimates over existing offline EM implementation, accepted at WSDM 2019. Rankings comparison project accepted at RecSys REVEAL workshop.

Bloomberg, *ML Engineer* *June 2017 - August 2017*

- Worked in the ML R&D team to improve auto-complete suggestions in the Bloomberg terminal using user logs. Adapted our counterfactual PropDCG model, and developed the full learning pipeline.

Two Sigma, *Quantitative Software Developer* *June 2015 - August 2015*

- Worked in the Market Making team to develop tools for analysis and strategy simulation, and derive trading insights from historical high-frequency data.

UNDERGRADUATE RESEARCH

Online Learning Project *October 2015 - December 2015, April 2016 - June 2016*

- Worked with Professor Yisong Yue on an online convex optimization algorithm for Dueling Bandits.

Summer Undergraduate Research Fellow *July 2014 - September 2014*

- Worked with Professor Chris Umans on complexity theoretic reductions related to polynomial identity testing and factorization.

Summer Undergraduate Research Fellow *June 2013 - August 2013*

- Worked with Professor Mathieu Desbrun in graphics on a discrete shells model for cloth simulation.

Selected code is available here: https://github.com/aman-agarwal

AWARDS AND HONORS

- **SIGIR 2019 Student Travel Grant.** 2019
- **WSDM Doctoral Consortium NSF Award.** 2019.

- Invited to **Amazon Graduate Research Symposium** for poster presentation. *2017.*
- **KDD 2017 Student Travel Award.** *2017.*
- **Cornell Fellowship** awarded to select first-year computer science PhD students. *2016.*
- **Hixon Writing Prize** – $1500 for the best freshman humanities paper "Two Approaches to Knowledge". *2013.*
- **Third Prize** at the Caltech Computer Science Fair for an **Android photo-sharing app** called Grapevine**.** *2015.*
- **Jack Memorial Award nomination** by the Dean for being in the **upper 5 percent of the junior class**. *2015.*
- **Searle Prize nomination** by Prof. Cowie for bioethics paper "What's So Wrong About Human Cloning?" *2016.*
- Top 25 students selected from across India for the **International Math Olympiad** (IMO). *2011.*
- Top 20 students selected from across India for the **International Olympiad in Informatics** (IOI). *2010.*
- **National Talent Search Examination scholarship** from the Government of India. *2008.*
- **Junior Science Talent Search scholarship (Rank 1)** from the Delhi state government. *2010.*
- **Vice Head Boy** of student government in Delhi Public School; chosen from 930 students. *2011-12.*
- Black stripe belt in **Taekwondo.** *2005.*