

Ashudeep Singh

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Cornell University

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Research Interests

Machine Learning · Recommender Systems · Information Retrieval · Fairness in ML · Responsible AI

Education

2015-2021 **Ph.D. Computer Science**, *Cornell University*, Ithaca, NY.

(expected) Advisor: Thorsten Joachims

Thesis Committee: Solon Barocas, Karthik Sridharan, David Mimno.

Topic: Fairness in Ranking and Recommendation Systems.

Relevant Coursework: Machine Learning Theory, Advanced topics in Machine Learning, Design and Analysis of Algorithms, Causality and Learning for Intelligent Decision Making, Ethics and Policy in Data Science.

Grade Point Average (GPA)– 4.0

2010–2015 **B.Tech.-M.Tech. Dual Degree**, *Indian Institute of Technology (IIT) Kanpur*, India.

Major: Computer Science and Engineering.

M.Tech. GPA– 10/10, BTech. GPA– 9.6/10

Publications

Conference Publications

Marco Morik*, Ashudeep Singh*, Jessica Hong, Thorsten Joachims. **“Controlling Fairness and Bias in Dynamic Learning-to-Rank”**. In Proceedings of 43rd International ACM SIGIR Conference on Research and Development in Information Retrieval 2020. (* equal contribution) ☞ **[Best Paper Award]**

Ashudeep Singh and Thorsten Joachims. **“Policy Learning for Fairness in Ranking”**. In Proceedings of Advances in Neural Information Processing Systems (NeurIPS) 2019, Vancouver, BC, Canada. ☞

Ashudeep Singh and Thorsten Joachims. **“Fairness of Exposure in Rankings”**. In KDD '18: The 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (SIGKDD), August 19–23, 2018, London, United Kingdom. ☞

Tobias Schnabel, Adith Swaminathan, Ashudeep Singh, Navin Chandak, Thorsten Joachims. **“Recommendations as Treatments: Debiasing Learning and Evaluation”** In Proceedings of The International Conference on Machine Learning (ICML) 2016, New York, NY, USA. ☞

David Adamson, Akash Bharadwaj, Ashudeep Singh, Colin Ashe, David Yaron, Carolyn P. Rosé. **“Predicting Student Learning from Conversational Cues”**. In Proceedings of 12th International Conference of Intelligent Tutoring Systems (ITS), Honolulu, HI, USA, June, 2014. ☞

David Adamson, Divyanshu Bhartiya, Biman Gujral, Radhika Kedia, Ashudeep Singh, Carolyn P. Rosé. **“Automatically Generating Discussion Questions”**. In Proceedings of 16th International Conference of Artificial Intelligence in Education (AIED), Memphis, TN, USA, July, 2013. ☞

Working Papers

Ashudeep Singh, Yoni Halpern, Nithum Thain, Konstantina Christakopoulou, Ed H. Chi, Jilin Chen, Alex Beutel. **“Building Healthy Recommendation Sequences for Everyone: A Safe Reinforcement Learning Approach”**. In FAccTRec Workshop at ACM RecSys, 2020. *Full paper under submission*. ↗

Workshop Papers

Ashudeep Singh, Thorsten Joachims. **“Equality of Opportunity in Rankings”**. At Workshop on Prioritising Online Content at NeurIPS 2017. ↗

Ashudeep Singh, Thorsten Joachims. **“Learning item embeddings using biased feedback”**. At Causal Inference and Machine Learning for Intelligent Decision Making Workshop at NeurIPS 2017. ↗

Research Internships

January–May **Google Brain, New York, NY.**

2020 **“Avoiding Unhealthy Recommendation Experiences using Safe Reinforcement Learning”**

Research Internship project mentored by Alex Beutel (Google Brain).

Formulated a sequential recommendation framework that considers the long-term well being of the users and proposed a novel Safe Reinforcement Learning algorithm that provides risk guarantees for the worst-case users.

May–August **Microsoft Research, Montreal, QC, Canada.**

2019 **“Feedback Loops and Producer-side Fairness in Recommender systems”**

Research Internship project working with Fernando Diaz (FATE Group).

Studied the intertwined phenomenon of *selection bias* and *exposure unfairness* for the producers in recommender system feedback loops. The goal was to specify the conditions under which these effects amplify and to propose algorithms to alleviate them.

May–August **Facebook, Menlo Park, CA.**

2017 **“Active Learning for Multilabel Classification on Newsfeed”**

Research internship project working with Khalid El-Arini (Feed Content Classification Team at Facebook Newsfeed).

Developed an active learning approach to optimize for the trade-off between model accuracy and human labeling effort for a large-scale multilabel classification problem on the Facebook Newsfeed.

May–August **Microsoft Research Lab, New York City, NY.**

2016 **“Contextual Bandits for Personalization of notifications in Microsoft Health”**

Research internship project working with John Langford (MSR NYC) and Ryen White (Microsoft Health and MSR Redmond).

Developed a *Contextual Bandits* based approach to personalize reminder and notification messages on the Microsoft Health App to optimize for user’s long term health and fitness.

Awards and Achievements

2020 Awarded the **Best Paper Award** at ACM SIGIR 2020.

2019 Awarded the NeurIPS Travel Award to attend NeurIPS 2019, Vancouver, BC, Canada.

2019 Outstanding TA Award by the Department of Computer Science for CS6780: Advanced Machine Learning class.

2018 Awarded the ACM Student Travel Award to attend SIGKDD 2018, London, UK.

2015 **Ranked first** in the M.Tech. class of 108 students graduating in 2015 at IIT Kanpur.

2011–2015 Awarded **Academic Excellence Award** for outstanding academic achievements at IIT Kanpur for four consecutive years.

- 2010–2014 Awarded **CBSE Merit Scholarship** for Professional Studies by Central Board of Secondary Education, India.
- 2012 Recipient of **Summer Undergraduate Research Grant for Excellence (SURGE)**, granted by Dean Resource Planning and Generation, IIT Kanpur.

Professional Service

○ Program Committee (PC member)

- ACM FAccT Conference 2021
- FAccTRec workshop at ACM RecSys 2020
- FACTS-IR Workshop at SIGIR 2019
- Repl4NLP Workshop at ACL 2018

○ Reviewer

- ICLR 2021
- NeurIPS 2020
- ICML 2020
- AAAI 2020
- ICML 2019
- NeurIPS 2019

Positions of Responsibility and Extra Curricular Activities

- Ph.D. Admissions Committee for Department of Computer Science (CS), Cornell University. (2019)
- Organized the Machine Learning Discussion Group at Cornell University. ↗ (2016–18)
- Coordinated the PhD Visit Day 2016 for Cornell Computer Science as a **Visit Day Czar**. (2016)
- Student Guide, Academic Mentor and Link Student for Counselling Service, IIT Kanpur. (2011–13)
- Member of Hall Executive Committee, Hall 9, IIT Kanpur (2011–12)

Teaching and Mentorship

- **Teaching Assistant** for CS6780: Advanced Machine Learning, CS4786: Machine Learning for Data Science, CS4780/5780 : Machine Learning for Intelligent Systems at Cornell University. (2015–19)
 - Awarded an Outstanding TA Award for CS 6780: Advanced Machine Learning. (Spring 2019)
- **Teaching Assistant** for CS679: Machine Learning for Vision and ESC101: Fundamentals of Computing at IIT Kanpur. (2014–15)
- Mentored and collaborated with several undergraduates and masters students at Cornell University. (2017–20)
 - Zili Zhou (Cornell)
 - Ibiyemi Abiodun (Cornell)
 - Hannah Lee (Cornell)
 - Andrei Kozyrev (Cornell)
 - Marco Morik (TU Berlin)
 - Jessica Hong (Cornell, now Google)
 - Vianca Hurtado (Cornell)
 - Kenta Takatsu (Cornell, now UMass Amherst)
 - Xiang (Felix) Fu (Cornell, now MIT)
 - Junyoung (Jared) Lim (Cornell)
 - Pian Pawakapan (Cornell)

References

- Thorsten Joachims (Ph.D. Advisor)
Professor, Department of Computer Science
Cornell University, Ithaca, NY
tj@cs.cornell.edu
- Fernando Diaz
Google Research, Montreal, QC, Canada
diaz@acm.org
- Alex Beutel
Google Research, New York, NY
alexbeutel@google.com